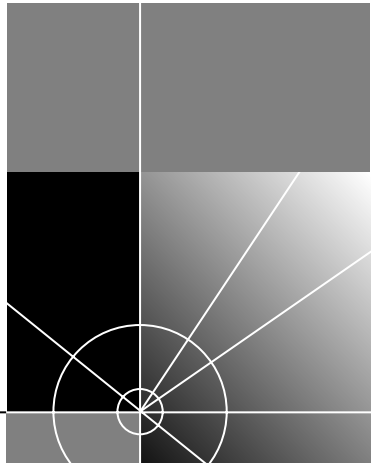
CoreBuilder® 3500 Getting Started Guide



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About This Guide

Introduction

This guide provides all the information that you need to set up your CoreBuilder® 3500 high-function switch and get it operating in your network. This guide provides an overview of your system and step-by-step procedures for planning your configuration, installing, cabling, powering up, and troubleshooting. When you are ready to configure your system, see the *CoreBuilder 3500 Implementation Guide*. For details on system configuration commands, see the *Command Reference Guide*.

If the information in the Software Installation and Release Notes that are shipped with your system differs from the information in this guide, follow the instructions in the Release Notes.

CAUTION: *Hazardous energy exists within the system. Always be careful to avoid electric shock or equipment damage. Many installation and troubleshooting procedures should be performed only by trained technical personnel. See "Safety Precautions" on page 59 for more information.*

Audience

This guide is intended for the network administrator who is responsible for installing and managing the network hardware. It assumes a working knowledge of local area network (LAN) operations. It does not assume prior knowledge of this high-performance networking equipment.

Finding Specific Information in This Guide

For information on	Turn to
Best ways of using the system	"Features of the System" on page 17
Front and back panels	"System Overview — Front Panel" beginning on page 20
System processor and modules	"CoreBuilder 3500 Modules" on page 22
Site requirements and other issues to consider before installing your system	"Before You Begin" on page 27 and Appendix C, "Site Requirements and Safety Codes"
Installing the system	"Installing the System on a Table Top" on page 27 OR "Installing the System in a Distribution Rack" on page 28
Inserting media modules	"Installing a Module" on page 29

For information on	Turn to
Cabling rules and pin assignments:	
■ System processor serial ports	"Cabling the System Processor Ports" on page 31
■ Fast Ethernet modules	"Fast Ethernet Modules" beginning on page 34
■ Gigabit Ethernet modules, including GBIC modules	"Gigabit Ethernet Modules" beginning on page 37
■ FDDI modules	"Cabling FDDI Modules" beginning on page 42
Performing system power up and checking diagnostics LEDs	"Power Up" beginning on page 47
Deciding how to manage your system	"How Do You Want to Manage the System?" on page 53
Setting up your modem	"Modem Setup" on page 55
Configuring the IP interface	"Configuring the IP Management Interface" on page 56
Diagnosing hardware and software problems	"Diagnosing Problems" beginning on page 60
Environmental and compliance specifications	Appendix A, "System Specifications"
Removing and replacing field-replaceable units	Appendix B, "Field-Replaceable Components"
Checking your site for environmental and safety considerations	Appendix C, "Site Requirements and Safety Codes"
Getting help from your network supplier or 3Com	Appendix D, "Technical Support"
Returning 3Com products to 3Com for repair	"Returning Products for Repair" on page 89

Conventions

Table 1 and Table 2 list conventions that are used throughout this guide.

Table 1 Notice Icons

Icon	Notice Type	Description
	Information Note	Information that describes important features or instructions
	Caution	Information that alerts you to potential loss of data or potential damage to an application, system, device, or network
	Warning	Information that alerts you to potential personal injury

Table 2 Text Conventions

Convention	Description
Syntax	The word "syntax" means that you must evaluate the syntax provided and supply the appropriate values. Example: To set the date, use the following syntax: `CCYY-MM-DDThh:mm:ss`
Commands	The word "command" means that you must enter the command exactly as shown in text and then press Return or Enter. Example: To update the system software, enter the following command: **`system softwareUpdate`** *This guide always gives the full form of a command in uppercase and lowercase letters. However, you can abbreviate commands by entering only enough characters to differentiate each command. Commands are not case sensitive. See the* Command Reference Guide.
`Screen displays`	This typeface represents information as it appears on the screen.
The words "enter" and "type"	When you see the word "enter" in this guide, you must type something, and then press Return or Enter. Do not press Return or Enter when an instruction simply says "type."
Key combinations	If you must press two or more keys simultaneously, the key names are linked with a plus sign (+). Example: Press Ctrl+Alt+Del.
Words in *italics*	Italics are used to: ■ Emphasize a point ■ Denote a new term when it is defined in text

CoreBuilder 3500 Documentation

The following documents comprise the documentation set. Documents are available in one of two forms:

- Paper documents

  The paper documents that are shipped with your system and components are listed in the next section.

- Online documentation

  The *CoreBuilder 3500 System Software and Documentation CD* contains online versions of the paper documents, the multiplatform *Command Reference Guide*, and the *CoreBuilder 3500 Implementation Guide*, as well as the CoreBuilder 3500 system software.

To order a paper copy of a document that you see on the compact disc, or to order additional compact discs, contact your network supplier.

Paper Documents

These documents are shipped with your system:

- *CoreBuilder 3500 Unpacking Instructions*

  How to unpack your system. Also an inventory list of all the items that are shipped with your system.

- *CoreBuilder 3500 Software Installation and Release Notes*

  Information about the software release, including new features, software corrections, and known problems. It also describes any changes to the documentation.

- *CoreBuilder 3500 Quick Installation Guide*

  Information for a quick installation of the system.

- *CoreBuilder 3500 Getting Started Guide* (this guide)

  All the procedures necessary for getting your system up and running, including information on installing, cabling, powering up, configuring, and troubleshooting the system.

- *Administration Console Command Quick Reference* booklet

  A quick reference guide to all of the Administration Console commands for the system.

- *CoreBuilder 3500 Web Management User Guide*

  How to use the Web Management suite of applications to manage the system using an Internet browser.

Each module and field-replaceable unit is shipped with a guide:

- *CoreBuilder 3500 System Processor Removal and Replacement Guide*

  Provides overview information and removal and replacement instructions for the system processor.

- *Module Installation Guides*

  An overview, LED status information, and installation instructions for each module.

- *GBIC Transceiver Installation Guide*

  Information about the Gigabit Interface Converter (GBIC) transceiver and how to install it.

- *CoreBuilder 3500 Power Supply Assembly Removal and Replacement Guide*

  Overview information and removal and replacement instructions for the power supplies.

- *CoreBuilder 3500 Fan Tray Removal and Replacement Guide*

  Overview information and removal and replacement instructions for the fan tray.

- *PCMCIA Flash Card Installation Guide*

  Information on using the PCMCIA card to save and restore system configuration settings.

- *Blank Faceplate Installation Guide*

  Information about the replacement faceplate that must cover empty slots.

Software and Documents on CD-ROM

The compact disc that comes with your system contains the system software, online versions of the paper guides that are shipped with your system, and this documentation:

- *Command Reference Guide*

  A complete multiplatform reference of all Administration Console commands for this system and several others.

- *CoreBuilder 3500 Implementation Guide*

  Important considerations, examples, and other information about how to use the features of your system.

- *Help System for Web-based Management*

  Online Help system for the Web Management suite of applications.

Documentation Comments

Your suggestions are very important to us. They help us to make our documentation more useful to you.

Please send e-mail comments about this guide to:

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Please include the following information when you comment:

- Document title
- Document part number (found on the front or back page of each document)
- Page number

Example:

CoreBuilder 3500 Getting Started Guide

Part Number 10012619

Page 53

Year 2000 Compliance

For information on Year 2000 compliance and 3Com products, visit the 3Com Year 2000 Web page:

http://www.3com.com/products/yr2000.html

1 System and Setup Overview

This chapter contains:

- An overview of 3Com's CoreBuilder® 3500 Layer 3 high-function switch
- Information on how this switch provides system solutions for your network
- Network configuration examples
- A description of the major features and components of the system

Layer 3 High-Function Switch

The CoreBuilder 3500 Layer 3 high-function switch is a modular, standalone networking device that supports high-performance Fast Ethernet, Gigabit Ethernet, and FDDI interfaces.

The system supports this extensive set of features and functionality:

- 10/100BASE-TX Fast Ethernet module
- 100BASE-FX Fast Ethernet MMF module
- 100BASE-FX Fast Ethernet SMF module
- 1000BASE-SX Gigabit Ethernet module
- 1000BASE GBIC (Gigabit Interface Converter) module
- FDDI MMF module
- FDDI SMF module
- IP routing (RIP and OSPF support)
- IPX routing
- AppleTalk routing
- Multicast and broadcast firewall thresholds
- SNMP MIB management
- Spanning Tree Protocol
- Virtual LANs (VLANs)
- TraceRoute
- DNS client
- Internetwork routing
- Packet filtering
- Quality of Service (QoS)
- Remote monitoring (RMON)
- Web-based management

The system is tuned for performance migration and bandwidth management. It supports the forwarding of switched routed packets at wire speed on all ports.

The switch is designed to act as a backbone LAN router, replacing legacy LAN routers for Layer 3 forwarding functionality. It can also be used as an edge device, performing Layer 3 forwarding when you connect it to a Gigabit Ethernet backbone.

This powerful switch uses 3Com's custom ASIC technology, which brings high performance and reliability to your network. The system also provides state-of-the-art network interfaces for all your networking configurations.

CoreBuilder 3500 System Solutions

Your system allows you to create additional capacity and improve performance without increasing the complexity of your network. Your new system provides these solutions:

- Improves performance by integrating segmented Ethernet-based LANs with Fast Ethernet and Gigabit Ethernet
- Supports additional heterogeneous media including Fiber Distributed Data Interface (FDDI)
- Increases bandwidth to the server by creating a high-speed downlink to a centralized server or by supporting a local high-speed file server
- Switches rather than shares bandwidth, providing dedicated 100 Mbps Fast Ethernet segments
- Provides parallel communications between users and increases the aggregate bandwidth by allowing information to flow directly from one physical port to another
- Increases bandwidth by dividing your network into smaller segments
- Allows you to add more switch ports as your network grows

Features of the System

The CoreBuilder 3500 system combines Fast Ethernet, Gigabit Ethernet, FDDI, transparent bridging, VLAN, and intranetwork routing in a single system. These concepts are described in detail in the *CoreBuilder 3500 Implementation Guide*.

This Layer 3 high-function switch includes integrated management to provide fault tolerance and maximum network availability. System management is accessible in several ways:

- CoreBuilder 3500 Administration Console, a command-line interface
- Web-based management by means of online forms and an extensive Help system, using an Internet browser
- Transcend® Enterprise Manager for UNIX or Windows. Transcend Enterprise Manager is 3Com's SNMP-based network management software for LAN switching systems.
- Other standard network manager software that is based on SNMP, such as SunNet Manager, HP OpenView, or IBM NetView AIX

Network Configuration Examples

Figure 1 on page 18 shows the CoreBuilder 3500 being used as a workgroup switch that provides wire-speed routing between workgroups.

Because routing between workgroups occurs at wire speed, you can move servers to a centralized location, thus saving the time and money associated with administrative overhead.

Figure 2 on page 19 shows the CoreBuilder 3500 being used to migrate from an FDDI backbone to a resilient Gigabit Ethernet backbone.

Figure 1 CoreBuilder 3500 Used as a Workgroup Switch

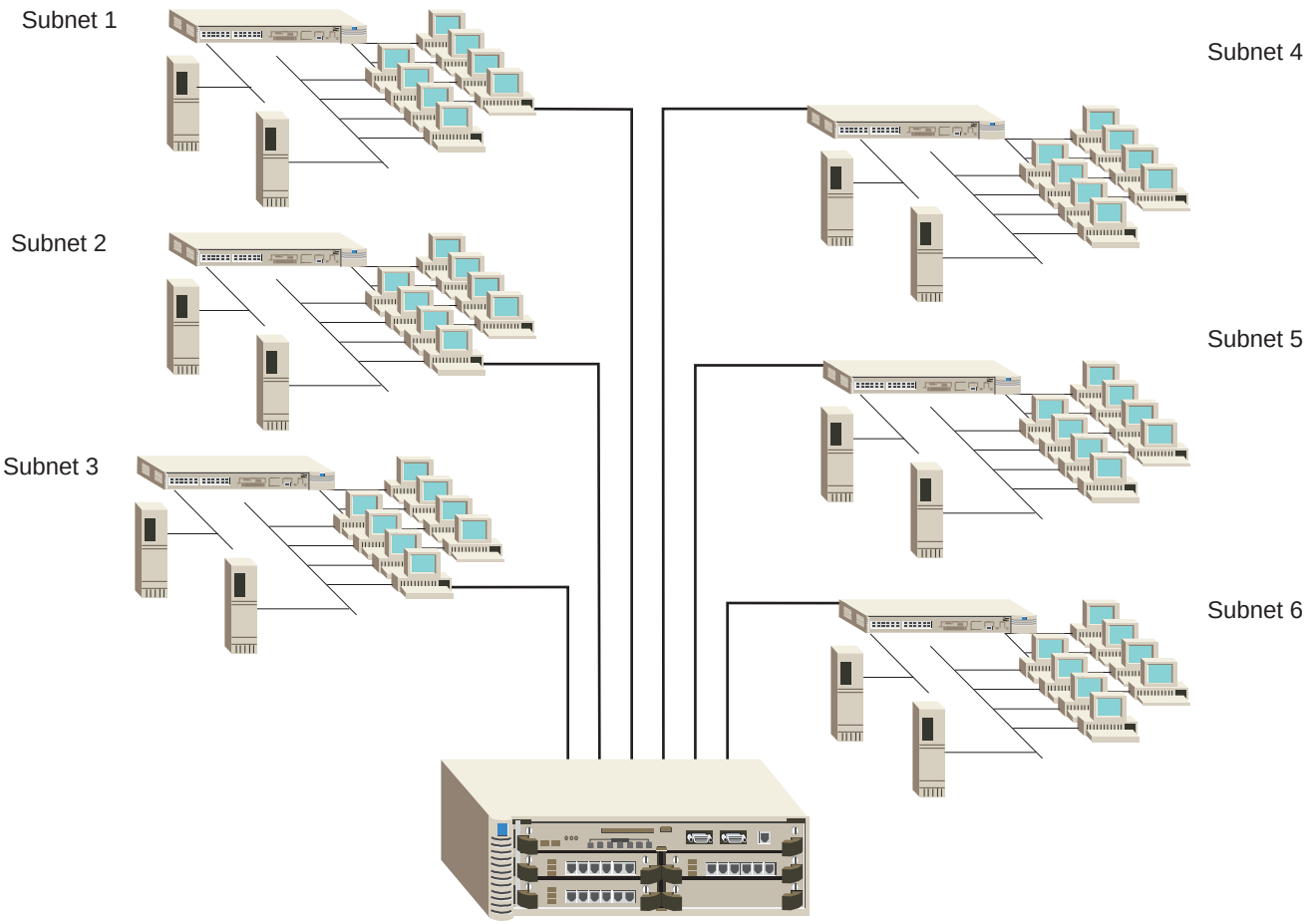
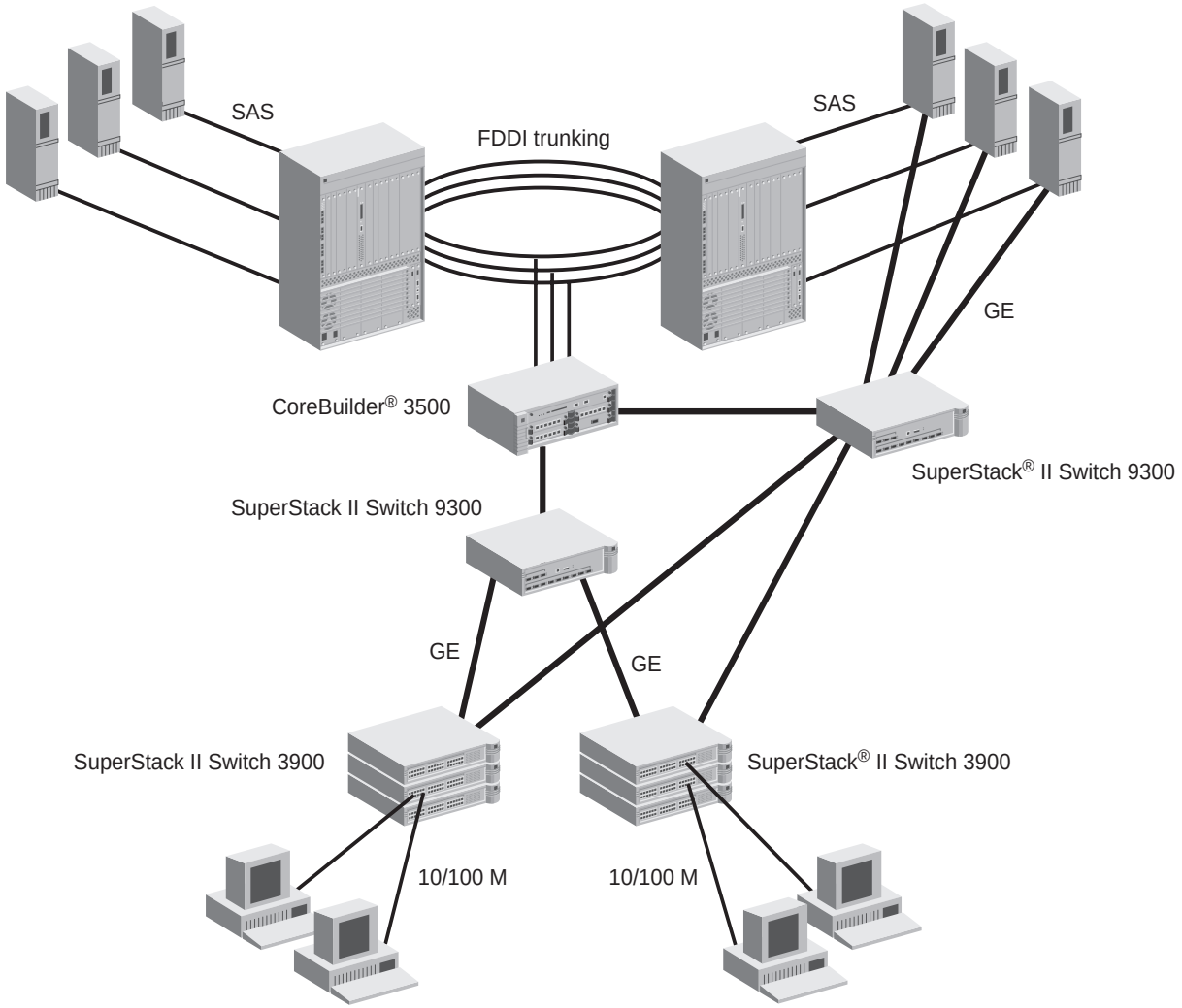
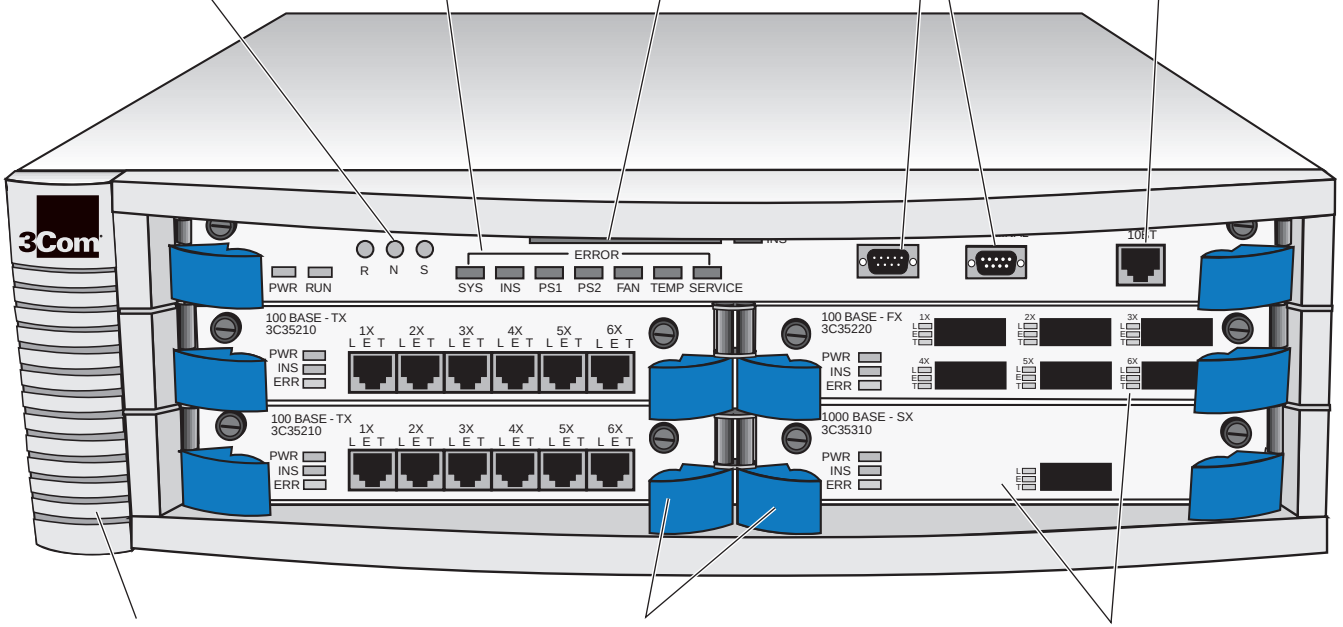


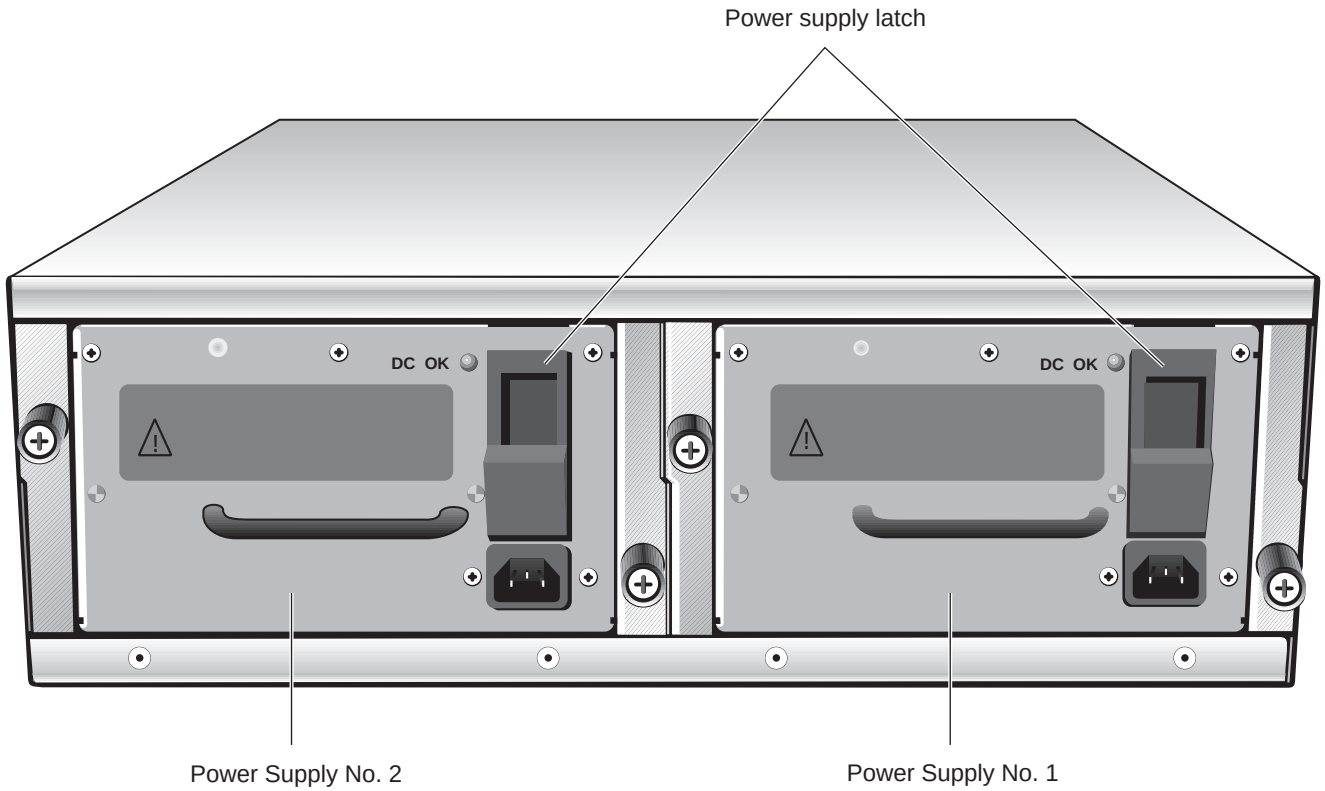
Figure 2 CoreBuilder 3500 Used as a Gigabit Ethernet Backbone Switch



System Overview — Front Panel



System Overview — Back Panel



CoreBuilder 3500 Modules

The CoreBuilder 3500 Layer 3 high-function switch has five slots. The longest slot, across the top of the device, holds the system processor. The slots below the system processor can hold up to four network-interface modules. The system processor and modules are described in the following sections.

System Processor Module

The system processor stores, boots, and executes the system software. It also manages system resources and stores critical system configuration information in nonvolatile memory.

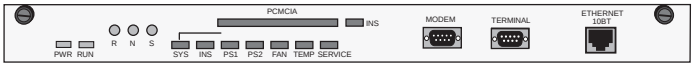
You can manage the system *locally* through a terminal serial port connection or *remotely* using an IP or modem connection on the system processor. The system processor provides the following network connections:

- Two serial (RS-232C) ports:
  - Port 1 for a terminal connection
  - Port 2 for an external modem connection
- One out-of-band Ethernet port (RJ-45) for an IP management connection

The system processor front panel also includes several LEDs, three system support switches for use by 3Com support and service personnel, and a PCMCIA slot for software storage and upgrades.

Figure 3 shows the system processor front panel.

Figure 3 System Processor Module



For removal and replacement instructions, see Appendix B or the guide that is shipped with the replacement system processor.

Fast Ethernet Modules

Each system can accommodate up to four Fast Ethernet modules. The modules are hot-swappable.

The Fast Ethernet modules are available in these configurations:

- 6-port RJ-45 10/100BASE-TX

  The 10/100BASE-TX module autonegotiates between 10 and 100 Mbps and autosenses full-duplex and half-duplex mode.

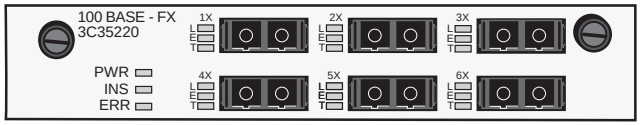
- 6-port SC 100BASE-FX MMF and SMF

  The 100BASE-FX, which is 100 Mbps only, is available for multimode and single mode fiber.

Figure 4 illustrates the Fast Ethernet modules.

Figure 4 Fast Ethernet Modules

100BASE-TX



100BASE-FX

Module specifications for the Fast Ethernet modules are provided in Table 3 and Table 4.

Table 3 Fast Ethernet 100BASE-FX Module MMF Specifications

Parameter	Value
Minimum TX output power	–19 dBm
Maximum TX output power	–14 dBm
Minimum RX input sensitivity	–32.5 dBm
Maximum RX input sensitivity	–14 dBm
Power Budget	11 dBm
Wavelength	■ Min 1270 nm ■ Typical 1310 nm ■ Max 1380 nm

Table 4 Fast Ethernet 100BASE-FX Module SMF Specifications

Parameter	Value
Minimum TX output power	–19 dBm
Maximum TX output power	–14 dBm
Minimum RX input sensitivity	–32.5 dBm
Maximum RX input sensitivity	–14 dBm
Power Budget	11 dBm
Wavelength	■ Min 1270 nm ■ Typical 1310 nm ■ Max 1380 nm

For module installation instructions, see Chapter 3 or the guide that is shipped with the module.

FDDI Modules

FDDI modules are available in the following configurations:

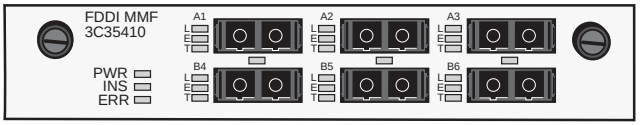
- **FDDI MMF** — Connects to multimode fiber-optic cable and provides a transmission distance of up to 2 km (1.24 mi) using 62.5-micron fiber.
- **FDDI SMF** — Connects to single-mode fiber-optic cable and provides a transmission distance of up to 14.4 km (8.95 mi) using 9-micron fiber.

FDDI MMF and FDDI SMF modules contain six FDDI ports that use fiber (SC) connectors, providing a 100 Mbps FDDI connection over fiber-optic cable. The ports support both SAS (single-attached station) and DAS (dual-attached station) modes to provide a maximum of six SAS connections or three DAS connections.

Each system can accommodate up to four FDDI modules. The modules are hot-swappable.

Figure 5 illustrates the FDDI MMF module. The FDDI SMF module is similar.

Figure 5 FDDI MMF Module



For module installation instructions, see Chapter 3 or the guide that is shipped with the module.

Gigabit Ethernet Modules

Gigabit Ethernet modules are supported in the following configurations:

- 1000BASE-SX

  The single-port Gigabit Ethernet module supports 1000BASE-SX MMF in either 62.5-micron or 50-micron multimode fiber.

- 1000BASE GBIC

  The single-port GBIC (Gigabit Interface Converter) module uses a 1000BASE GBIC transceiver to connect to your Gigabit Ethernet network.

Each system can accommodate up to four Gigabit Ethernet modules. The modules are hot-swappable.

To ensure optimal performance, compatibility, and regulatory compliance, use only GBIC transceivers and conditioned launch cables that 3Com supports. For a list of currently supported GBICs and launch cables, visit this 3Com Web site:

`http://www.3Com.com/gigabit_ethernet/gbics`

For more information about GBIC transceivers, see the GBIC Transceiver Installation Guide.

Figure 6 illustrates the 1000BASE-SX Gigabit Ethernet module. Figure 7 illustrates the 1000BASE GBIC module.

Figure 6 1000BASE-SX Gigabit Ethernet Module

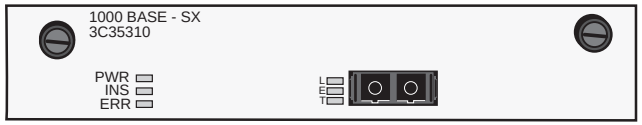
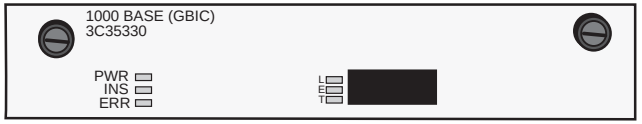


Figure 7 1000BASE GBIC Module



For module installation instructions, see Chapter 3 or the guide that is shipped with the module.

2 INSTALLING THE SYSTEM

This chapter describes how to install your CoreBuilder® 3500 system on a table top or in a distribution rack.

- To install the system on a table top, read these instructions:
  - Before You Begin
  - Installing the System on a Table Top
- To install the system in a distribution rack, read these sections:
  - Before You Begin
  - Installing the System in a Distribution Rack

Before You Begin

Before you begin the installation procedures, be sure that you:

- Move the system close to where you plan to install it.
- Have a No. 2 Phillips screwdriver available.
- Have the system mounting kit available. See Table 5.

Table 5 System Mounting Kit

Item	Qty	To use in
Rubber feet (self-adhesive)	4	Table top installation
Mounting bracket	2	Installing the system in the distribution rack
8-32 x 1/2 Phillips flat-head screws	8	Installing distribution-rack mounting brackets
10-32 x 1/2 Phillips pan-head screws	4	Installing the system in the distribution rack

Installing the System on a Table Top

To install the system on a table top:

1. Place the system on its side on the table.
2. Remove the protective covering from each rubber foot to expose the adhesive surface.
3. Place one rubber foot in each of the marked areas at the corners of the bottom of the system.
4. Turn the system onto its feet.
5. Ensure that nothing blocks the air intake and fan exhaust vents.

You are now ready to install the media modules into the system. For installation instructions, see Chapter 3 or the guides that are shipped with the modules.

Installing the System in a Distribution Rack

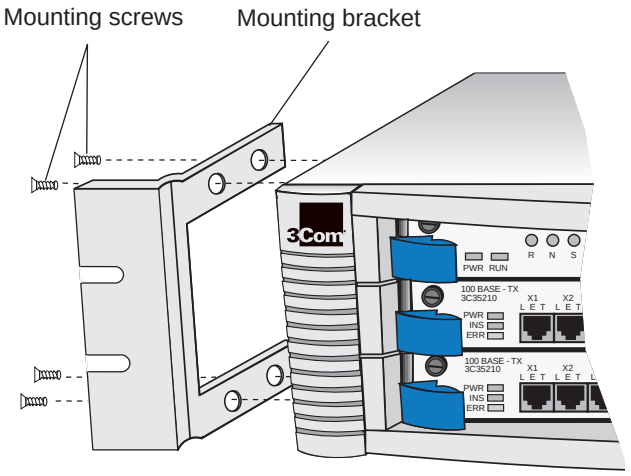
You can mount the system into a standard 19-inch distribution rack. This section describes how to prepare the system and rack and how to mount the system. For information on distribution rack requirements, see Appendix C.

Preparing the System and Rack

To prepare the system and distribution rack for installation:

1 Attach one of the L-shaped mounting brackets to one side of the system using the 8-32 x 1/2 Phillips flat-head screws. Attach the other bracket to the other side. See Figure 8.

Figure 8 Installing System Mounting Brackets



2 Carefully lift the system into place, aligning the bracket holes with the distribution rack holes.

3 While you hold the system in place, insert the four mounting screws (10-32 x $^1/_2$ Phillips pan-head) into the mounting holes on each side of the rack.

4 Tighten the mounting screws.

You are now ready to install the media modules into the system. For installation instructions, see Chapter 3 or the guides that are shipped with the modules.

3 INSTALLING MEDIA MODULES

Your CoreBuilder® 3500 system is shipped with the system processor installed but with no modules installed. Protective blank faceplates cover the module installation slots. To prepare the system for configuration, read these sections:

- Avoiding ESD Damage
- Installing a Module

For specific module overview, LED status information, installation instructions, and diagnostics information, see the module installation guide that is shipped with each module.

For information on replacing the system processor, see Appendix B.

Avoiding ESD Damage

ESD occurs when a module is improperly handled. ESD can damage components on a module, causing complete or intermittent failures.

To prevent ESD-related damage, handle the module in the following manner:

- Always wear an ESD wrist strap, ensuring that it is appropriately grounded and makes good skin contact.
- Keep the module in its antistatic shielded bag until you are ready to install it.
- Always handle the module by its edges.
- Do not touch the pins, leads, or solder connections.

Installing a Module

This installation procedure takes only a few minutes to complete. You may need a small flat-bladed screwdriver to install the module.

CAUTION: *When you are handling modules, 3Com recommends that you always use a wrist strap connected to a proper ground to prevent the module from being damaged by ESD. Also, when you are not using the module, store it in an antistatic bag.*

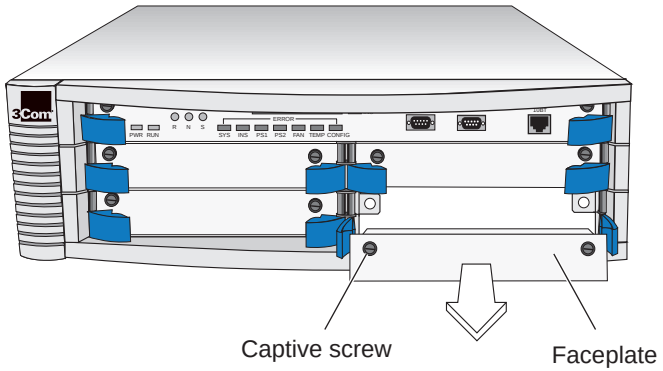
To install a module in the system:

1. Put on the ESD wrist strap.
2. Discharge yourself of static electricity by touching a mounting screw located on the system's mounting bracket.

   If your system is installed on a table, touch the system's back panel.
3. Choose the slot where you want to insert the module.
4. Loosen the two captive screws on the faceplate that covers the selected slot. Use a small, flat-bladed screwdriver if necessary.

5 Remove the faceplate by grasping the injector/ejector handles and simultaneously rolling them outward. See Figure 9. Save the faceplate for future use.

Figure 9 Removing a Faceplate



6 Remove the module from its antistatic bag.

7 Verify that the injector handles are in the outward position.

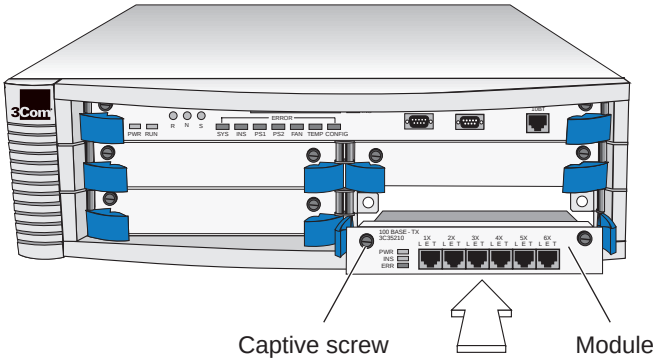
8 Place the module between the guides of the selected slot and slide the module gently into the chassis until it stops. See Figure 10.

9 To seat the module, firmly roll the injector handles inward to engage the backplane connectors. You feel a slight resistance as the connectors engage.

CAUTION: *If the resistance is too great, the connectors may not be aligned. Forcing the module inward can damage the connectors. If necessary, remove and reinsert the module, ensuring that the connectors are properly aligned. Do not seat the module by tightening the captive screws.*

Figure 10 shows a module that is being installed in a system.

Figure 10 Installing a Module



10 Tighten the module's captive screws to firmly secure the module in the chassis.

11 Repeat steps 1 through 10 to install the remaining modules.

The module is now ready to be cabled. See Chapter 4.

4 CABLING

This chapter describes how to cable your CoreBuilder® 3500 system for connecting these elements to your network:

- System processor ports
- Fast Ethernet modules
- Gigabit Ethernet modules
- FDDI modules

When all your Fast Ethernet, Gigabit Ethernet, FDDI, and system network connections are complete, see Chapter 5.

If you are staging the system, you do not need to connect it to the network yet. However, to view possible error messages while the system is running power-up diagnostics, you do need to connect a terminal, a workstation, or a PC with terminal emulation to the system's terminal port. See Chapter 6.

Cabling the System Processor Ports

The system processor ports provide the following connectivity options:

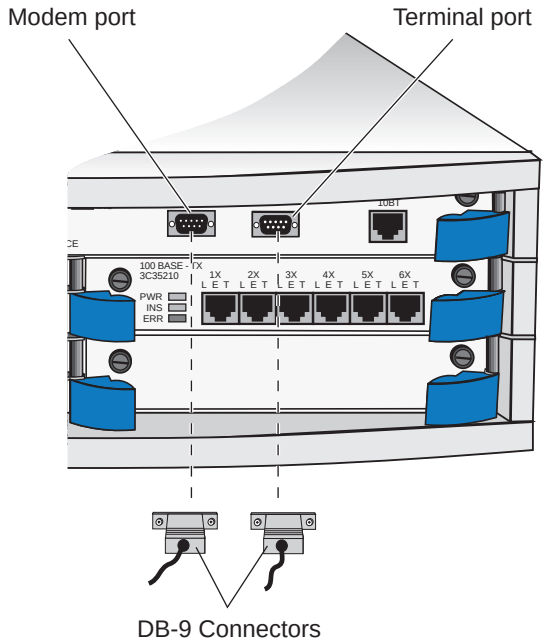
- One serial (RS-232C) *modem* port for an external modem connection
- One serial (RS-232C) *terminal* port for a terminal connection
- One 10BASE-T (RJ-45) port for an out-of-band connection

Cabling the Serial Ports

To connect to the modem port or the terminal port:

1. Attach the female DB-9 connector to the selected modem or terminal port.
2. Tighten the connector screws.
3. Attach the other end of the serial cable to your modem or terminal. See Figure 11.

Figure 11 Cabling the System Processor Serial Ports



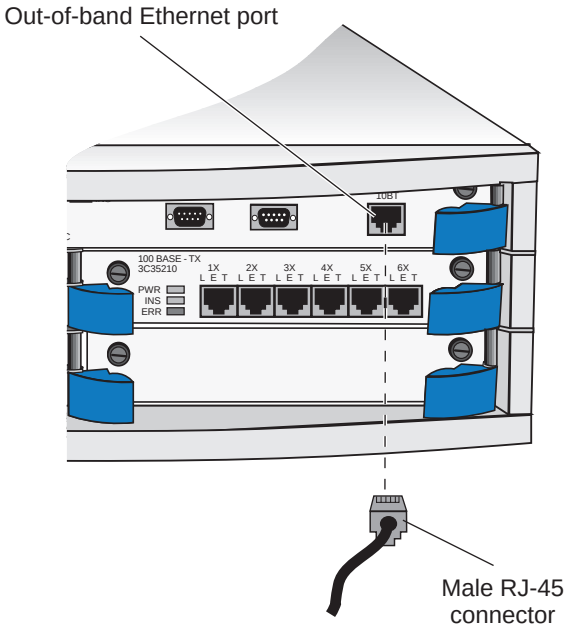
You are now ready to configure your system for management access through the serial ports. See Chapter 6.

Cabling the Out-of-band Port

To connect the out-of-band Ethernet port:

1. Insert one end of the 10BASE-T cable into the RJ-45 jack that is labelled 10BT. See Figure 12.
2. Attach the other end of the 10BASE-T cable to your PC, workstation, or other networking device.

Figure 12 Cabling the Out-of-band Port



You can also access the system processor through any module's Ethernet port using Telnet or rlogin.

You are now ready to configure your system for management access through the out-of-band Ethernet port. See Chapter 6.

Processor Port Pin Assignments

This section describes the pin assignments for the management access ports on the system processor.

Table 6 shows the modem port pin assignments.

Table 7 shows the terminal port pin assignments.

Table 8 shows the pin assignments for the out-of-band 10BASE-T Ethernet port.

Table 6 Modem Port Pin Assignments

Pin No.	Signal	Description
1	DCD	Data carrier detect
2	RXDA	Received data
3	TXDA	Transmitted data
4	DTR	Data terminal ready
5		Signal ground
6		Not used
7	RTS	Request to send
8	CTS	Clear to send
9		Not used

Table 7 Terminal Port Pin Assignments

Pin No.	Signal	Description
1		Not used
2	RXDB	Received data
3	TXDB	Transmitted data
4		Not used
5		Signal ground
6		Not used
7		Not used
8		Not used
9		Not used

Table 8 10BASE-T Port Pin Assignments

Pin No.	Signal	Description
1	TD +	Transmit Data +
2	TD –	Transmit Data –
3	RD +	Receive Data +
4		Not used
5		Not used
6	RD –	Receive Data –
7		Not used
8		Not used

Fast Ethernet Modules

Your network's Fast Ethernet segments connect to the CoreBuilder 3500 system through Fast Ethernet modules, which come in two versions:

- 10/100 BASE-TX with six twisted-pair RJ-45 connectors, discussed next
- 100BASE-FX with six fiber SC connectors, discussed in the "Cabling the 100BASE-FX Module" section beginning on page 36

Your system can support up to four Fast Ethernet modules.

This section describes the Fast Ethernet modules and how to connect them to the network.

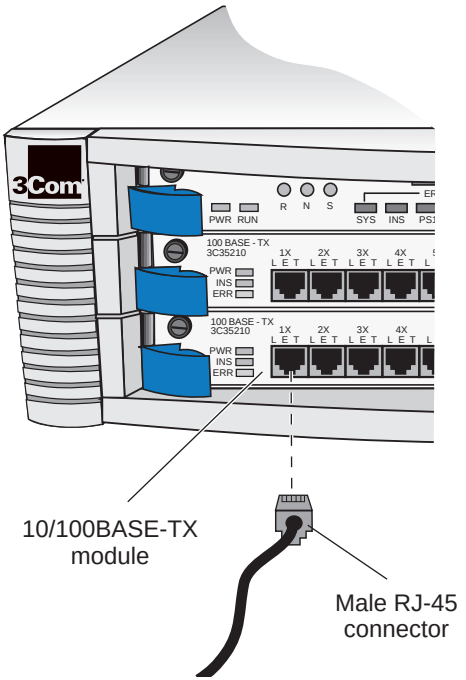
Cabling the 10/100BASE-TX Module

The 10/100BASE-TX module has six Fast Ethernet ports that use RJ-45 connectors and provide 10/100 Mbps Ethernet connections over UTP-Category 5 copper wire.

To cable the 10/100BASE-TX module:

1. Insert the male RJ-45 connector on the 10/100BASE-TX cable into the selected port on the Fast Ethernet module until it clicks into place. See Figure 13.
2. Attach the other end of the cable to an MDI port on the network device that you want to connect.
3. Repeat for each port that you want to connect.

Figure 13 Cabling the 10/100BASE-TX Module



10/100BASE-TX Port Pin Assignments

Table 9 shows the port pin assignments for the 10/100BASE-TX port.

Table 9 10/100BASE-TX Port Pin Assignments

Pin No.	Signal	Description
1	RD +	Receive Data +
2	RD –	Receive Data –
3	TD +	Transmit Data +
4		Not used
5		Not used
6	TD –	Transmit Data –
7		Not used
8		Not used

Fiber and Laser Safety Precautions

The 100BASE-FX Fast Ethernet modules, Gigabit Ethernet modules, and FDDI modules use light-emitting diodes (LEDs) and lasers in their fiber-optic ports. To ensure your safety when you install or work with these modules, comply with the precautions in this section.

WARNING: *The LEDs and lasers used in these modules meet the regulatory requirements for casual exposure to the eye. As with any source of bright light, however, 3Com recommends that you do not look into the LED or laser light source.*

IEC 825, Class 1 LED devices are for connection only to Class 1 LED devices.

IEC 825, Class 1 Laser devices are for connection only to Class 1 Laser devices.

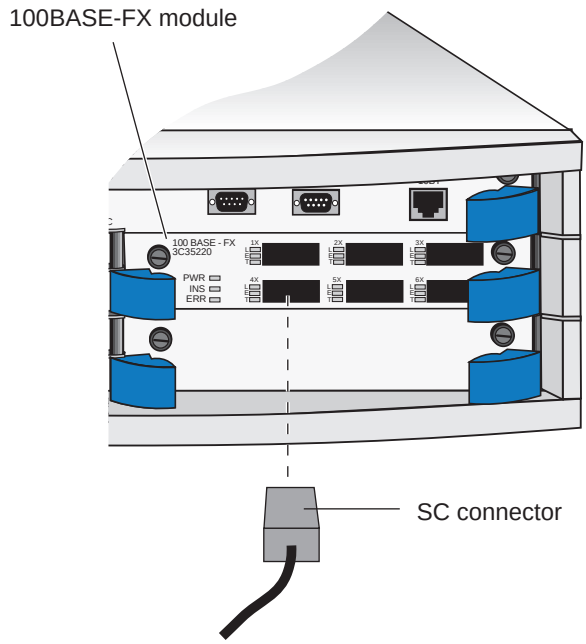
Cabling the 100BASE-FX Module

The 100BASE-FX module has six Fast Ethernet ports that use SC connectors and provide 100 Mbps Fast Ethernet connections over fiber cabling. The 100BASE-FX module is available for either single-mode fiber (SMF) or multimode fiber (MMF).

To cable the 100BASE-FX module:

1. Read and follow "Fiber and Laser Safety Precautions" in the previous section for safe operation.
2. Plug the male SC connector on the fiber cable into the selected port on the Fast Ethernet module until it clicks into place. See Figure 14.
3. Attach the other end of the fiber cable to the network device that you want to connect.

Figure 14 Cabling the 100BASE-FX Module



Gigabit Ethernet Modules

Your Gigabit Ethernet network connects to the system through a Gigabit Ethernet module. This single-port module is supported in these configurations:

- **1000BASE-SX MMF Module** — Can be used with either 62.5-micron or 50-micron multimode fiber. See "Cabling the 1000BASE-SX MMF Module" next for details.
- **1000BASE GBIC Module** — Connects to your Gigabit Ethernet network using a 1000BASE-LX or 1000BASE-SX Gigabit Interface Converter (GBIC) transceiver. See "Cabling the 1000BASE GBIC Module" on page 39 for details.

Your system can support up to four Gigabit Ethernet modules.

Guidelines for Gigabit Ethernet Cabling

For all Gigabit Ethernet cabling, keep the ports and connectors free of dust.

Recommended Distances for 1000BASE-SX Ports or Transceivers

When you cable SC connectors to 1000BASE-SX ports or transceivers, be sure that the length of the fibercable from the system to any attached device does not exceed these recommended distances:

- Use 62.5-micron MMF fiber with a modal bandwidth specification of 160 MHz*km for distances of up to 220 m (722 ft).
- Use 62.5-micron MMF fiber with a modal bandwidth specification of 200 MHz*km for distances of up to 275 m (902 ft).
- Use 50-micron MMF fiber with a modal bandwidth specification of 400 MHz*km for distances of up to 500 m (1645 ft).
- Use 50-micron, 500 Mhz*km modal bandwidth, MMF fiber for distances of up to 550 m (1805 ft).

Recommended Distances for 1000BASE-LX Transceivers

When cabling SC connectors to 1000BASE-LX transceivers, be sure that the length of the fiber cable from the system to any attached device does not exceed these recommended distances:

- Use 62.5-micron MMF fiber with a modal bandwidth specification of 160 MHz*km for distances of up to 550 m (1805 ft).
- Use 62.5-micron MMF fiber with a modal bandwidth specification of 200 MHz*km for distances of up to 550 m (1805 ft).
- Use 50-micron MMF fiber with a modal bandwidth specification of 400 MHz*km for distances of up to 550 m (1805 ft).
- Use 50-micron MMF fiber with a modal bandwidth specification of 500 MHz*km for distances of up to 550 m (1805 ft).

- Use 9-micron SMF fiber for distances of up to 10 kilometers (6.2 miles). The specification requires and specifies 5 kilometers (3.1 miles).

Use a conditioned launch cable to connect the 1000BASE-LX transceiver to multimode fiber. Using this cable ensures reliability over the maximum 550 m distance.

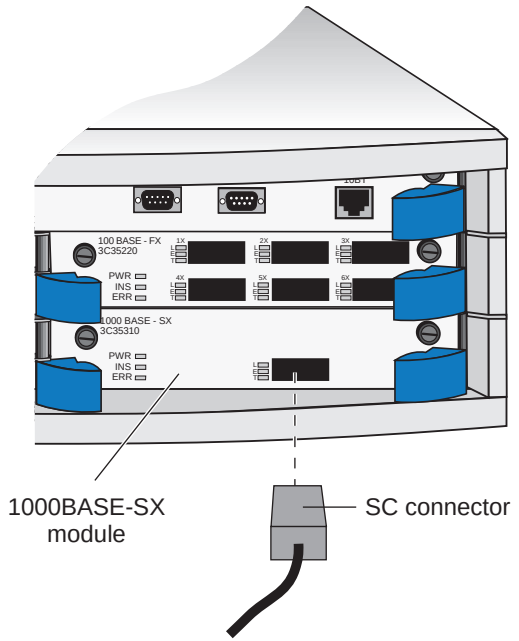
Cabling the 1000BASE-SX MMF Module

The 1000BASE-SX MMF module provides one Gigabit Ethernet port that uses multimode fiber with an SC connector.

To cable the 1000BASE-SX module:

1. Read and follow the "Fiber and Laser Safety Precautions" on page 35 for safe operation.
2. Plug the male SC connector on the fiber cable into the port on the Gigabit Ethernet module until it clicks into place. See Figure 15.
3. Attach the other end of the fiber cable to the network device that you want to connect.
4. Repeat steps 1 through 3 for additional Gigabit Ethernet modules.

Figure 15 Cabling the 1000BASE-SX Module



Cabling the 1000BASE GBIC Module

The 1000BASE GBIC module provides one GBIC (Gigabit Interface Converter) port that accepts one of these transceivers:

- **1000BASE-LX GBIC** — Use this transceiver to connect the GBIC module directly to a single-mode fiber-optic cable or to multimode fiber using a conditioned launch cable. For instructions on using this transceiver to connect to single-mode fiber, follow the procedure in this section. To connect this transceiver to multimode fiber, see "Connecting the LX Transceiver to MMF" on page 41 for details.
- **1000BASE-SX GBIC** — Use this transceiver to connect the GBIC module directly to multimode fiber-optic cable. For details, follow the procedure in this section.

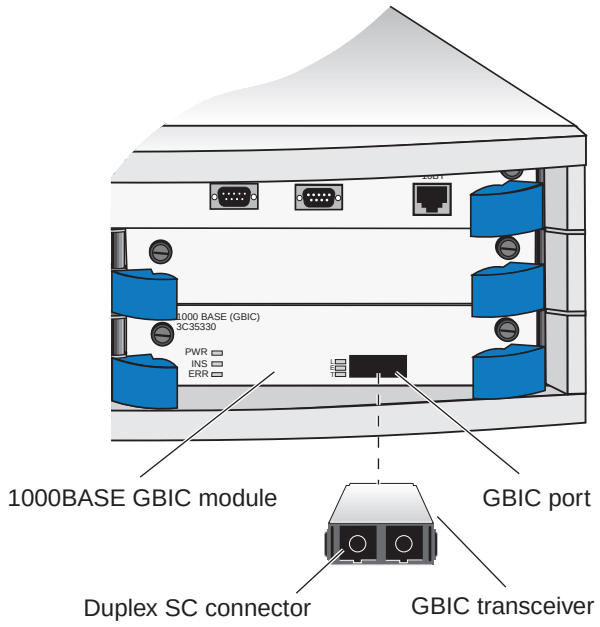
To ensure optimal compatibility, performance, and regulatory compliance, use only GBIC transceivers and conditioned launch cables that 3Com supports. For a list of currently supported GBICs and launch cables, visit this 3Com Web site:

`http://www.3Com.com/gigabit_ethernet/gbics`

To cable the 1000BASE GBIC module:

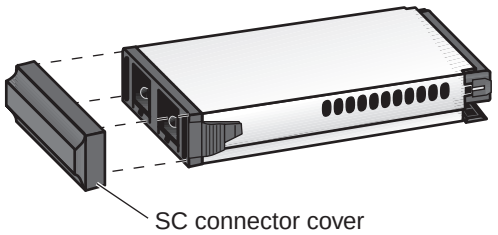
1. Read and follow the "Fiber and Laser Safety Precautions" on page 35 for safe operation.
2. Insert the GBIC transceiver into the GBIC port until it clicks into place, as shown in Figure 16. See the *GBIC Transceiver Installation Guide* for details.

Figure 16 Inserting the GBIC Transceiver



3 If you have not already done so, remove the SC connector cover from the transceiver, as shown in Figure 17.

Figure 17 Removing the SC Connector Cover

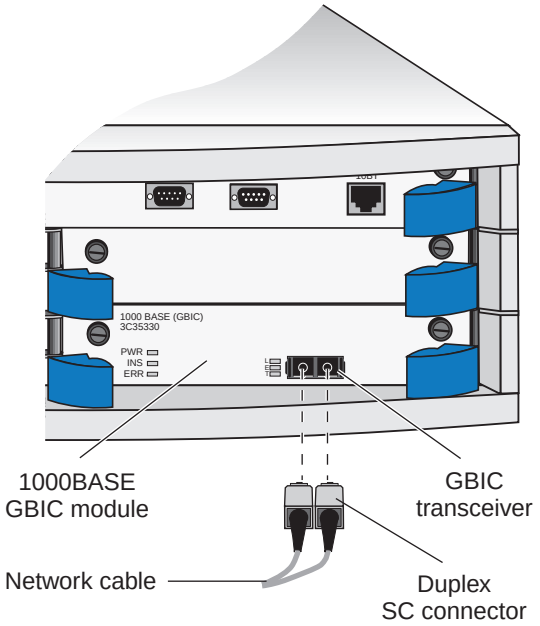


4 Attach the male duplex SC connector on the network cable into the duplex SC port on the GBIC transceiver, as shown in Figure 18.

- If you are using an SX transceiver, the network cable must support multimode transmission.
- If you are using an LX transceiver, the network cable must support single-mode transmission.

You can also connect an LX transceiver to multimode fiber. See "Connecting the LX Transceiver to MMF" on page 41 for details.

Figure 18 Cabling the GBIC Module



5 Attach the other end of the network fiber-optic cable to the network device that you want to connect.

6 Repeat steps 1 through 5 for additional GBIC modules.

Connecting the LX Transceiver to MMF

The LX transceiver supports a connection to multimode fiber by means of a conditioned launch cable. The conditioned launch cable consists of an offset mechanism on the transmit side of the cable that aligns the single-mode laser launch away from the center of the multimode fiber core, creating a transmission signal similar to launches from typical multimode light-emitting diodes (LEDs). This offset allows the transmission of LX signals over multimode fiber cable.

You need a conditioned launch cable to complete the following procedure. To ensure optimal compatibility, performance, and regulatory compliance, use only conditioned launch cables that 3Com supports. For a list of currently supported launch cables, visit this 3Com Web site:

`http://www.3Com.com/gigabit_ethernet/gbics`

To cable the GBIC module to multimode fiber using an LX transceiver:

1. Read and follow the "Fiber and Laser Safety Precautions" on page 35 for safe operation.
2. Insert the GBIC LX transceiver into the GBIC port until it clicks into place, as shown in Figure 16.
3. If you have not already done so, remove the SC connector cover from the transceiver, as shown in Figure 17.

*The SC Receive (RX) port is on the **left**, and the SC Transmit (TX) port is on the **right**, as you face the system. See Figure 19.*

4. Insert the SC connectors on the conditioned launch cable into the transceiver as shown in Figure 19, ensuring that you:
   - Insert the SC connector on the *multimode* Receive (RX) side of the conditioned launch cable into the RX port on the transceiver.
   - Insert the SC connector on the *single-mode* Transmit (TX) side of the conditioned launch cable into the TX port on the transceiver.

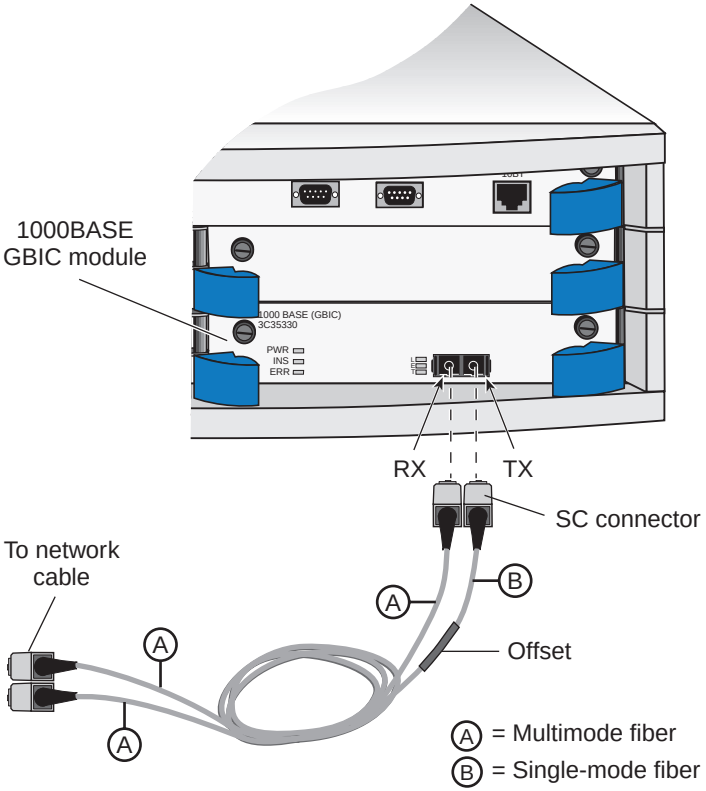
Think of the conditioned launch cable as an extension to the multimode network cable.

5. Attach the other end of the conditioned launch cable to the multimode network cable, verifying that you:
   - Connect the multimode RX side of the conditioned launch cable to the RX side of the network cable.
   - Connect the multimode TX side of the conditioned launch cable to the TX side of the network cable.

If necessary, use fiber-optic couplers to connect the male SC connectors on the multimode end of the conditioned launch cable to the multimode network cable.

6. Attach the other end of the network fiber-optic cable to the network device that you want to connect.

Figure 19 Connecting Using a Conditioned Launch Cable



7 Repeat steps 1 through 6 for additional 1000BASE GBIC modules.

Cabling FDDI Modules

Your network's FDDI segments connect to the CoreBuilder 3500 system through FDDI modules, which come in two versions:

- **FDDI MMF** — Connects to multimode fiber-optic cable
- **FDDI SMF** — Connects to single-mode fiber-optic cable

Both modules contain six FDDI ports that use duplex SC fiber-optic connectors. You can configure the FDDI ports to support either of these modes:

- **Single-attached station (SAS) mode** — Using a single port, this connection allows you to attach the module to one of the dual counter-rotating FDDI rings. In most cases, the SAS station connects to the primary ring, as the secondary ring is on standby in case the primary fails. A single FDDI module supports up to six SAS connections. See "Cabling a Single-Attached Station" on page 43 to configure this type of connection.
- **Dual-attached station (DAS) mode** — Using two FDDI ports, this connection allows you to attach the module to both of the dual, counter-rotating FDDI rings. This configuration provides high fault tolerance. A single FDDI module supports up to three DAS connections. See "Cabling a Dual-Attached Station" on page 44 to configure this type of connection.

When module availability and connectivity is crucial, you can connect your DAS-configured module to the network using dual homing*. For more information, see the FDDI chapter in the* CoreBuilder 3500 Implementation Guide*.*

For more information on configuring DAS and SAS modes, see the `fddi stationMode modify` *command in the* Command Reference Guide*.*

Cabling a Single-Attached Station

A module connected to your FDDI network as a single-attached station (SAS) uses a single FDDI interface (one of the six module ports) to connect to one of the network rings. The module can then receive and transmit signals over this single connection. Use SAS connections where cost is important and where existing wiring does not support dual connections.

An FDDI port configured in SAS mode can connect to another FDDI network device, such as a concentrator or workstation, which in turn can connect to the dual counter-rotating rings of the FDDI network.

FDDI defines two types of SAS ports: Master (M) ports and Slave (S) ports. All SAS ports on your FDDI MMF module are defined as Master ports. This is important to know when determining which FDDI connection policy you want to use.

For a complete list of FDDI connection policies, see the FDDI chapter in the CoreBuilder 3500 Implementation Guide*.*

To cable the module as a single-attached station:

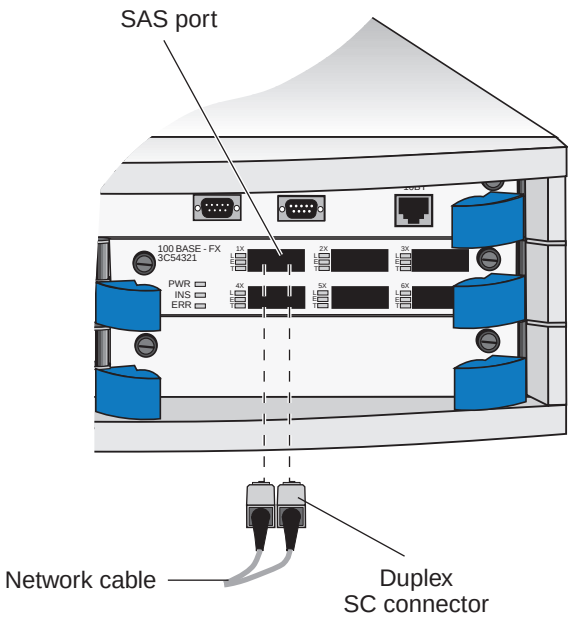
1. Read and follow the "Fiber and Laser Safety Precautions" on page 35 for safe operation.
2. Configure the module ports that you are working with to support SAS mode. See the `fddi stationMode modify` command in the *Command Reference Guide* for more information.
3. Insert the network fiber-optic cable into the SAS port (configured as a Master port) on the module, as shown in Figure 20.
4. Connect the other end of the network cable to a SAS port (configured as a Slave port) on the FDDI network device to which you are connecting. This FDDI network device may be any device with an available S port, for example, a concentrator, a server, or a workstation.

Each FDDI port consists of a transmit side and a receive side. For each FDDI port-to-port connection, verify that you cable the transmit side of one FDDI port to the receive side of the FDDI port to which you are connecting; and the receive side of one port to the transmit side of the other.

*When a module port is properly connected, the port's Link status (**L**) LED lights.*

5. Repeat steps 1 through 4 for additional SAS connections.

Figure 20 Cabling the SAS Connection



For more information about single-attached stations, see the CoreBuilder 3500 Implementation Guide.

Cabling a Dual-Attached Station

An FDDI module connected as a dual-attached station (DAS) is connected to both the primary and secondary rings of an FDDI network. Use DAS connections where reliability is important and additional fault tolerance is required. Each DAS connection consists of an A port and a B port. In a typical DAS configuration:

- The primary ring's light signal is received on Port A and reenters the primary ring through Port B.
- The secondary ring's light signal is received on Port B and reenters the secondary ring through Port A.

The six FDDI ports are labelled A1 through A3 and B4 through B6, as shown in Figure 21.

Figure 21 FDDI Module Front Panel

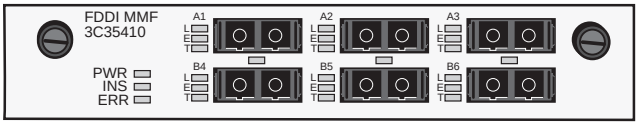


Table 10 shows the associated ports that comprise each possible DAS connection.

Table 10 DAS Connection Port Assignments

DAS Connection	Port A	Port B
1	A1	B4
2	A2	B5
3	A3	B6

For more information about dual-attached stations, see the CoreBuilder 3500 Implementation Guide.

To cable the module as a dual-attached station:

1. Read and follow the "Fiber and Laser Safety Precautions" on page 35 for safe operation.
2. Configure a DAS connection on your FDDI module. This connection involves configuring the ports that you are working with to support DAS mode. See the `fddi stationMode modify` command in the *Command Reference Guide*.
3. Connect the cable coming in from the primary ring (from Port B of the preceding DAS station) to Port A of the DAS connection on the FDDI module, as shown in Figure 22. This connection also connects the signal going out to the secondary ring to Port A.

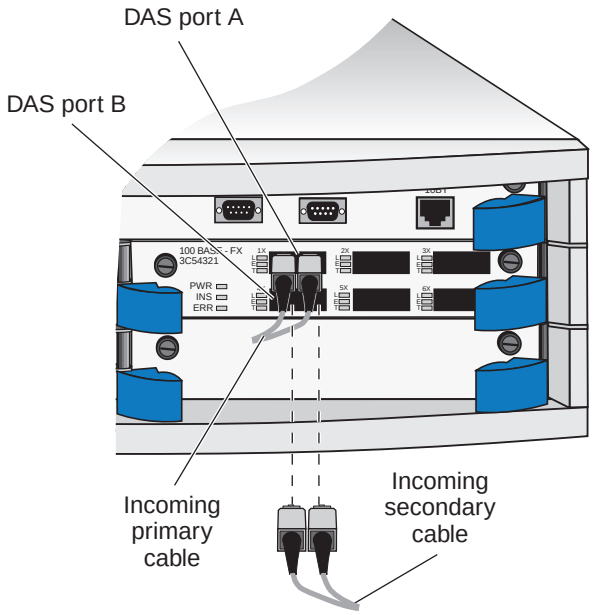
*When a module port is properly connected, the port's Link status (**L**) LED lights.*

Each FDDI port consists of a transmit and receive side. For each FDDI port-to-port connection, verify that you cable the transmit side of one FDDI port to the receive side of the FDDI port to which you are connecting; and the receive side of one port to the transmit side of the other.

4. Connect the cable coming in from the secondary ring (from Port A of the preceding DAS station) to Port B of the DAS connection on the FDDI module, as shown in Figure 22. This connection also connects the signal going out to the primary ring to Port B.

*When a module port is properly connected, the port's Link status (**L**) LED lights.*

Figure 22 Cabling the DAS Connection



5. Repeat steps 1 through 4 for additional DAS connections.

For a complete list of FDDI connection policies, see the FDDI chapter in the CoreBuilder 3500 Implementation Guide.

5 System Power Up

This chapter contains:

- Instructions for powering up the CoreBuilder® 3500 system
- Description of power-up diagnostics
- Items to check after system power up

If you have any problems in powering up your system, see Chapter 7.

Power Up

To get your system powered up and ready to operate, follow the steps in this section.

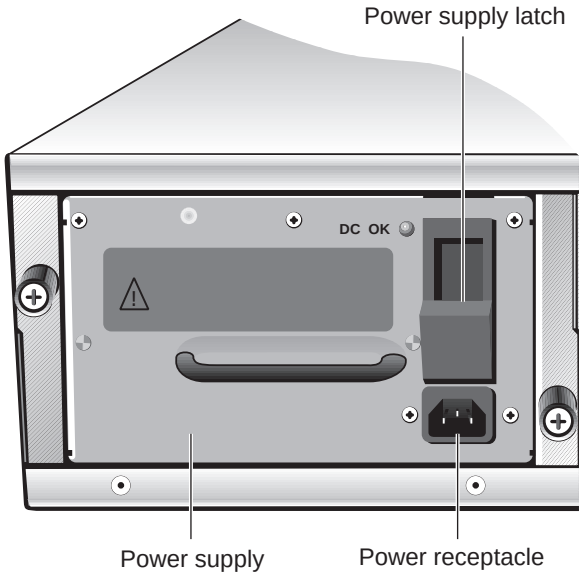
To view possible error messages while the system is running power-up diagnostics, connect a terminal, workstation, or PC with terminal emulation software to the system's terminal serial port.

See Chapter 4 and Chapter 6 for information about cabling and configuring the terminal serial port.

1. After you have installed all the media modules, cover each unused slot in the chassis with a blank faceplate. The faceplates protect the system from dust and foreign objects and ensure proper system cooling.
2. On the back panel, slide the power supply latch up and plug the power cord into the power receptacle. See Figure 23 for the power receptacle's location.

CAUTION: *To prevent a possible fire hazard, ensure that the power cord is fully inserted.*

Figure 23 System Power Receptacle



3. Insert the other end of the power cable into a power outlet.
4. If your system contains dual power supplies, perform steps 2 and 3 for the second power supply.

Power-up Diagnostics

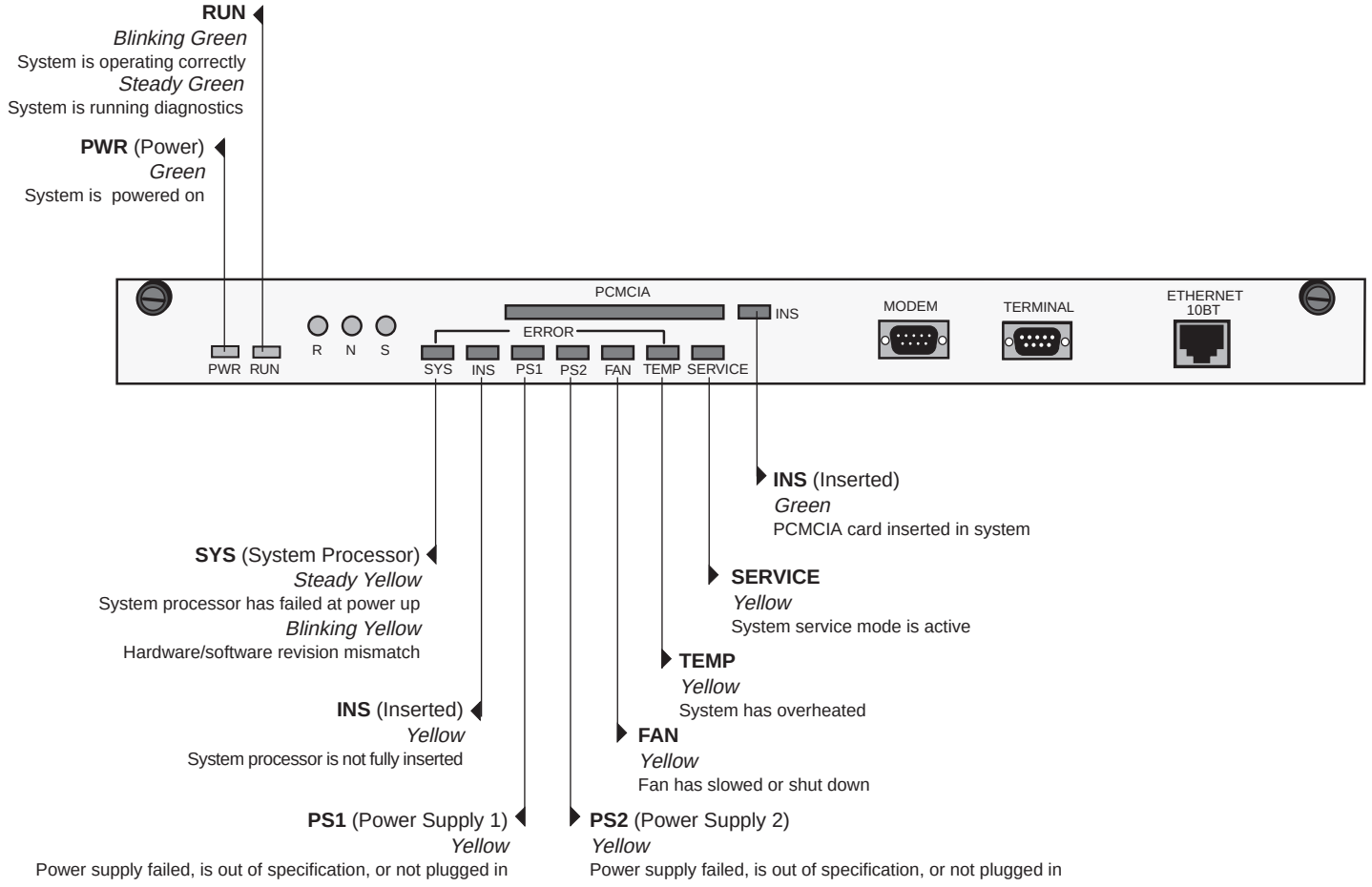
The system automatically runs diagnostic software at power up. This software verifies that every component in the system is operating correctly.

If any component fails during power-up diagnostics, the system either fails to power up or the faulty module comes up but all of its ports are out of service. When the system comes up, check to see which modules, if any, have failed diagnostics by checking the module LEDs or, if you are connected to a workstation, by viewing the system configuration display in the Administration Console.

During power up, the system processor LEDs provide information on components in your system. See Figure 24 for more information.

System Processor LEDs

Figure 24 System Processor LEDs



System Diagnostics — LED Activity

When you first power up the system, the system processor **PWR** LED and **RUN** LED light green, indicating that the system is receiving power and running diagnostics. After the system diagnostics are successfully completed, the **RUN** LED blinks green, indicating that the system is operating. If the **SYS** LED lights yellow, the system processor has failed at power up.

If the system processor fails, see Chapter 7 for troubleshooting information.

You can view messages displayed during power-up diagnostics if you connect a terminal, workstation, or PC with terminal emulation software to the system processor's terminal serial port.

Module Diagnostics — LED Activity

Module diagnostic software checks each module and the module's ports. Module LEDs report these events:

- If the module's **ERR** LED still lights yellow after the system is finished running diagnostics, the module did not successfully complete the power-up diagnostics.
- If the module's **ERR** LED blinks yellow while the system is running diagnostics, the diagnostics have found a hardware/software compatibility error.
- If the system successfully completes the power-up diagnostics and the module's port status **E** (error) LEDs light yellow, an error condition has occurred with the associated port or that port has been disabled through the Administration Console or Web Management software.
- When the diagnostics are completed successfully, the port status **L** (link status) LEDs for connected ports light green.
- On Fast Ethernet, Gigabit Ethernet, GBIC, and FDDI modules, when the port is receiving or transmitting data, the port status **T** (traffic status) LEDs blink green.

Table 11 summarizes the module LED activity.

Table 11 Module Diagnostics — LED Activity

LED Name	Color	Indicates
ERR (Error - Module)	Steady yellow	Diagnostics failed.
	Blinking yellow	A hardware/software mismatch has occurred.
E (Error - Port)	Yellow	Port not operational.
L (Link status - Port)	Green	Diagnostics successful.
T (Traffic status - Port)	Green	Port is receiving or transmitting data.

System Checks

After the system has successfully completed the power-up diagnostics, check the items in Table 12 to verify that the system is operating correctly.

Table 12 System Power-up Checklist

Check	Why?
Power-up error messages	If the software finds a problem during power up, messages are displayed in the Administration Console connection through the terminal serial port.
Normal LED activity	When the power-up diagnostics are running, the LEDs light in the pattern described on page 48 in the section "Power-up Diagnostics." After the system successfully completes the power-up diagnostics, check for the following normal LED activity:
System	**PWR** LED = green
	RUN LED = blinking green
	SYS LEDs = off
Module	**ERR** LED = off
Ports	**L** LEDs (Link port status) = green
	E LEDs (Error port status) = off
	T LEDs (Traffic port status) = flashing green

If you discover any abnormal conditions, see Chapter 7.

Next Step: Software Configuration

Your system is shipped from the factory with IEEE 802.1 bridging set to disabled.

To configure your system for your particular networking environment (including SNMP set up, customized packet filtering, and routing), you must first establish management access. See the procedures in Chapter 6.

6 Quick Setup for Management Access

This chapter provides easy instructions for configuring the CoreBuilder® 3500 system for management access. After you decide how you want to manage your system, follow the configuration instructions for your preferred type of management access.

About System Management

The Administration Console is an internal, character-oriented, menu-driven user interface for performing system administration. You can access the Administration Console using the serial ports or Internet Protocol (IP). For more information, see the *Command Reference Guide* on the *Software and Documentation CD*.

For more complete network management, use an external SNMP-based application, such as 3Com's Transcend® Enterprise Manager or another network management application, and access the system using IP.

3Com also provides the embedded Web Management suite of applications. This set of system administration tools allows you to manage the system over the Internet through a Web browser. The *Software and Documentation CD* includes some additional installable tools and the *Web Management User Guide*.

How Do You Want to Manage the System?

Table 13 describes the access mechanisms.

Table 13 Management Access Mechanisms

Access Mechanism	Access Description	Interface
Terminal	Connect directly to the Administration Console and stay attached during system reboots	Terminal serial port
Modem	Access the Administration Console from remote sites	Modem serial port
IP	■ Access the Administration Console using rlogin or Telnet commands OR ■ Use an external SNMP management application to communicate with the SNMP agent OR ■ Access the system's Web Management software across the Internet with a Web browser	Port assigned an IP address

These management access mechanisms are described more completely in the next sections.

Terminal Port

Direct access through the system processor terminal port allows you to remain on the system and monitor it during system boots. A Macintosh or PC attachment can use any terminal emulation program for connecting to the terminal serial port. A workstation attachment under UNIX can use the emulator TIP.

Modem Port

You can access the Administration Console from a remote terminal using an external modem attached to the system processor modem serial port.

IP Management Interface

An IP management interface allows you to manage the system in-band, or out-of-band through an Ethernet port. After you configure an IP management interface with a unique IP address, you can use rlogin or Telnet to connect remotely to the Administration Console using the TCP/IP protocol from a host computer, or you can use the embedded Web Management software and an Internet browser, or you can reach the SNMP agent from an external management application.

Initial Management Access

Initially, you must access the system through the terminal serial port. Configure your system using these default settings for this port:

- 9600 baud
- 8 bits, no parity
- 1 stop bit

When you access the Administration Console using the terminal serial port, you receive this prompt:

```
Select access level (read, write, administer):
```

1. At the prompt, enter: **`administer`**
2. At the `password` prompt, press Return or Enter.

   The Administration Console top-level menu appears. The next sections describe how to use this menu to set the terminal serial port baud rate, or to configure the system for other management access methods.

```
Menu options (CoreBuilder-28D300): ------------------------
  system          - Administer system-level functions
  management      - Administer system management interface
  ethernet        - Administer Ethernet ports
  fddi            - Administer FDDI resources
  bridge          - Administer bridging/VLANs
  ip              - Administer IP
  ipx             - Administer IPX
  appletalk       - Administer AppleTalk
  qos             - Administer QoS
  snmp            - Administer SNMP
  analyzer        - Administer Roving Analysis
  log             - Administer Message Log
  script          - Run a script of console commands
  logout          - Logout of the Administration Console

Type ? for help.
--------------------------- (http://159.181.52.100) -----
Select menu option:
```

Setting the Terminal Port Baud Parameter

To change the baud setting of the terminal port from the Administration Console, follow these steps:

1 From the top level of the Administration Console, enter:

```
system serialPort terminalSpeed
```

2 At the prompt, enter the baud setting for the terminal port. The system supports these baud settings: 19200, 9600, 4800, 2400, and 1200.

After you change the baud setting, you see this message:

```
Changing the baud rate may cause a loss of
communication since you are currently connected
via the serial port.

Are you sure you want to change the baud rate?
(y/n):
```

3 Enter **y** (for yes) or **n** (for no) at the prompt.

If you enter **y**, the baud setting is changed immediately and you can no longer communicate on the serial port until you adjust the baud setting of your terminal or terminal emulator to match. If you enter **n**, the baud setting does not change and you return to the previous menu.

Modem Setup

You can set up your system for access through an external modem that is attached to the system processor's modem port. To do this, you must first set the baud setting of the modem port (if necessary), and then attach and configure your external modem.

Some modem vendors disable the autoanswer parameter by default. Verify that your modem's autoanswer parameter is not disabled. Consult your modem's documentation for information on setting this parameter.

Setting the Modem Port Baud Parameter

Your system is shipped with these modem serial port parameters set as defaults: 9600 baud, 8 bits, no parity, 1 stop bit.

To change the baud setting of the modem port through the Administration Console, follow these steps:

1 From the top level of the Administration Console, enter:

```
system serialPort modemSpeed
```

2 At the prompt, enter the baud setting for the modem port. The system supports these baud settings: 19200, 9600, 4800, 2400, and 1200.

Connecting to an External Modem

To connect to and configure the external modem port, follow these steps:

1 From the top level of the Administration Console, enter:

```
system serialPort connectModem
```

You can now issue commands to the attached modem that support whatever communication parameters are appropriate to your installation. All characters that you enter in the Administration Console are transmitted to the modem port.

2 To break the connection, enter the escape sequence **~]** with no intervening characters.

When you enter the escape sequence, the connection to the modem port is broken and you return to the previous menu.

Configuring the IP Management Interface

These instructions include information on defining an out-of-band IP management interface through which you can manage your system.

In-band or Out-of-band Management?

If you manage your system and its attached LANs over the same network that carries your regular data traffic, then you are managing your system *in-band*. This kind of management is often the most convenient and inexpensive way to access your system. The disadvantage is that, if your data network is faulty, you may not be able to diagnose the problem because the management requests are sent over the same troubled network.

If you are managing your system using a dedicated network for management data, then you are managing your network *out-of-band*.

In-band Management

To manage your network in-band, you need to set up an IP routing interface. You can then choose to manage in-band through a VLAN, or using a port. See the *Command Reference Guide* for information on how to set up an IP routing interface.

Out-of-band Management

To manage your system out-of-band, you need to assign an IP address and subnet mask to the out-of-band Ethernet port on your system. The out-of-band Ethernet port is labeled "Ethernet 10BT" on the system processor module.

An out-of-band IP management interface contains the following parameters:

- **IP address** — Use this address, which is specific to your network, for managing the system. The IP address defines both the number of the network to which the interface is attached and its host number on that network.
- **Subnet mask** — A 32-bit number that uses the same format as IP addresses. The subnet mask determines which bits in the IP address are interpreted as the network number, which as the subnet number, and which as the host number. Each IP address that corresponds to a 1 in the subnet mask is in the network and subnet part of the address. Each IP address bit that corresponds to a 0 is in the host part of the IP address.

To set the interface parameters using the Administration Console, follow these steps:

1. From the top level of the Administration Console, enter:

   ```
   management ip interface define
   ```

2. Enter the IP address for the out-of-band port.
3. Enter the subnet mask. To accept the default or current value displayed in brackets, press the Return or Enter key.

   Example:

   ```
   Enter IP address: 158.101.1.1
   Enter subnet mask [255.255.0.0]: 255.255.255.0
   ```

For more information on defining an IP management interface or an IP routing interface, see the Command Reference Guide.

7 TROUBLESHOOTING THE SYSTEM

This chapter explains how to troubleshoot certain problems within the CoreBuilder® 3500 system. It covers how to identify and correct system problems and suggests some steps that you can take if you cannot resolve the problem.

Getting Additional Help

If you experience system problems that are not addressed in this chapter, contact 3Com Technical Support or your service representative. Before you call, gather the following information and have it available:

- Chassis type and serial number
- Maintenance agreement or purchase date and warranty information (See the last pages of this book for the Limited Warranty.)
- Software revision number
- Brief description of the problem

Some of this information can be viewed in the system display in the Administration Console or WebConsole. See the Command Reference Guide *or the* Web Management User Guide *for more information.*

For information on where to call, see Appendix D.

Safety Precautions

Be sure that you follow all safety precautions when you diagnose system problems.

WARNINGS: *Hazardous energy exists within the CoreBuilder 3500 system. Always be careful to avoid electric shock or equipment damage. Many installation and troubleshooting procedures should be performed only by trained technical personnel.*

When the system is on, never insert a metal object such as a screwdriver or a finger with jewelry into open module slots or into the system backplane.

When the system is on, do not touch any connections within the chassis with your hands or fingers.

When removing or replacing the system processor, modules, fan trays, and power supplies, observe all electrostatic precautions. Before handling the system processor or modules, always wear an ESD wrist strap that makes good skin contact and is connected to a proper ground.

Diagnosing Problems

By observing system diagnostics and reviewing the tables in this chapter, you can identify and correct problems that can occur at system power up.

Power Failures

If the system does not respond when you insert the power cord, see the troubleshooting suggestions in Table 14.

Abnormal LED Activity

The system processor contains several status LEDs that indicate system problems. Also, each module has status LEDs that alert you to problems on a module or port. See Table 15 and Table 16 for troubleshooting suggestions in the event of abnormal LED activity on the system processor or a module.

CAUTION: *To prevent the system processor and modules from damage by electrostatic discharge during handling, always wear a wrist strap that makes good skin contact and is connected to a proper ground.*

Table 14 Troubleshooting Power Failures

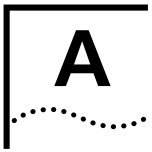
Symptom	Possible Sources of the Problem	Steps to Take
System does not power up.	■ System is not receiving power. ■ Power supply has malfunctioned.	**1** Verify that the building's power outlet has power. **2** Verify that the power cord is firmly inserted into the system and into the building's power outlet. **3** If the system still does not operate, contact your network supplier or 3Com Technical Support.

Table 15 Troubleshooting Abnormal Status Activity on the System Processor LEDs

LED Status	Possible Sources of the Problem	Steps to Take
RUN LED does not light.	Diagnostic software is not running.	Contact your network supplier or 3Com Technical Support.
SYS LED lights yellow.	System processor has failed.	**1** Disconnect the power cord. **2** Contact your network supplier or 3Com Technical Support.
SYS LED blinks yellow.	Hardware/software mismatch	**1** If you have added a new module, remove it. **2** If you have just updated software, reload the old version of software. **3** If the LED continues to blink, contact your network supplier or 3Com Technical Support for hardware/software incompatibility information.
PS1 or **PS2** LED lights yellow.	■ Power supply is not plugged in. ■ Power supply is out of specification. ■ Power supply has failed.	**1** Insert the indicated power supply into a power source. **2** If the LED still lights, call your network supplier or 3Com Technical Support.
TEMP LED lights yellow.	■ System temperature is too high. ■ Wiring closet is too hot. ■ System vents are blocked. ■ System fans are not operating. ■ System processor has failed. ■ Thermal sensor is faulty. ■ Backplane is faulty.	**1** Power down the system. **2** Verify that the room temperature meets the system's specifications. See Appendix A. **3** If the temperature is too high, lower the room's thermostat and wait until the room temperature meets the specifications. **4** Verify that nothing blocks the airflow from the system's vents. **5** Restart the system. If the **TEMP** LED still lights, the room temperature is still too high or the system processor is faulty. **6** Shut down the system, disconnect the power cord, and contact your network supplier or 3Com Technical Support.
FAN LED lights yellow.	Fan has slowed or shut down.	**1** If the system is not over temperature (that is, if the **TEMP** LED is not lit), you can continue to run the system until service is scheduled. However, the system should be serviced. **2** Contact your network supplier or 3Com Technical Support.

Table 16 Troubleshooting Abnormal Activity on the Module Status LEDs

LED Status	Possible Sources of the Problem	Steps to Take
PWR LED lights yellow.	Module has failed.	Replace the module with a new one.
INS LED lights yellow.	Module is not completely inserted.	Reseat the module.
ERR LED lights steady yellow.	Module has failed.	Replace the module with a new one.
ERR LED blinks yellow.	Hardware/software incompatibility	**1** If you have added a new module, remove it. **2** If you have just updated software, reload the old version of software. **3** If the LED continues to blink, contact your network supplier or 3Com Technical Support for hardware/software incompatibility information.
E LED (Error - Port Status) lights yellow	■ System does not recognize a connection to the port. ■ Cabling is not fully attached to the port. ■ Cable to the port is faulty.	**1** Verify that all cables are firmly inserted into the system's affected port and the attached device. **2** Verify that the cables are clean. **3** Test for faulty cables. When the problem is corrected, the **L** LED (Link - Port Status) lights green. **4** If the port status **E** LED (Error - Port Status) remains yellow, contact your network supplier or 3Com Technical Support.



SYSTEM SPECIFICATIONS

Physical Dimensions	13.2 cm H x 44.0 cm W x 42.42 cm D*
	(5.2 in. H x 17.3 in. W x 16.7 in. D*)
	**Depth includes protrusion of power supply handles — 3.12 cm (1.23 in.)*
	Weight (fully loaded with 2 power supplies): 18.14 kg (40.01 lb)
Environmental Requirements	
Operating temperature	0 to 50 °C (32 to 122 °F)*
	**Maximum operating temperature is at sea level. It increases 1.8 °C for every 1000 m above sea level (1 °F for every 3280 ft above sea level).*
Operating humidity	10% to 90% relative humidity, noncondensing
Storage temperature	–20 to 85 °C (–4 to 185 °F)
Storage humidity	10% to 95% relative humidity, noncondensing
Safety	
Agency certifications	UL 1950/CB Certificate (Underwriters Laboratories, USA) CSA 950-95 (Canadian Standards Association) TUV 950 (EN60950) (German Agency)
Over temperature protection	Automatic warning at 60 °C (140 °F)

Electromagnetic Emissions (Agency Certification)	FCC part 15, Subpart B, Class A limits EN 55 022 (CISPR-22) (Europe) VCCI (Japan) CE Mark
Immunity	EN50082-1 (IEC 801 Series)
Heat Dissipation	362 watts maximum (1237 BTU/hour maximum)
Power Supply	
AC line frequency	47 to 63 Hz
Input voltage options	90 VAC to 264 VAC
Current rating	100 VAC at 3.8 amperes (maximum) or 240 VAC at 1.5 amperes (maximum)
Redundancy	Dual power supplies

Standards Supported

SNMP

- **BRIDGE-MIB.mib** — Bridge MIB, RFC 1493
- **ETHERNET.mib** — Ethernet MIB, RFC 1398
- **FDDI-SMT73-MIB.mib** — FDDI SMT 7.3 MIB, RFC 1512
- **FDDI-MIB.mib** — FDDI Station Management MIB, RFC 1285
- **IANAifType-MIB-V1SMI.mib** — Internet Assigned Numbers Authority MIB, SMI Version 1, RFC 1573
- **IF-MIB-V1SMI.mib** — Interface MIB, RFC 1573
- **MIB2-MIB.mib** — MIB-II MIB, RFC 1213
- **OSPF-MIB.mib** — Open Shortest Path First MIB, RFC 1850
- **RMON-MIB.mib** — RMON MIB, RFC 1757
- **axonFddiRmon.mib** — AXON RMON MIB, proprietary support
- **RMON2-MIB-V1SMI.mib** — RMON v2, SMI Version 1 MIB, RFC 2021
- **SNMPv2-MIB.mib** — used by other MIBs, RFC 1907
- **SOURCE-ROUTING-MIB.mib** — Source Routing Bridges MIB, RFC 1595
- **VRRP-MIB.mib** — Virtual Router Redundancy Protocol MIB, Draft RFC

Software Installation

- FTP (RFC 959)
- TFTP (RFC 1350)

Terminal Emulation Protocols

- Telnet (RFC 854)
- rlogin (RFC 1282)

Protocols for Administration

- UDP (RFC 768)
- IP (RFC 791)
- ICMP (RFC 792)
- TCP (RFC 793)
- ARP (RFC 826)
- TFTP (RFC 1350)
- OSPF (RFC 1583)
- ICMP (RFC 1256)
- RIP (RFC 1058)
- RIP Version 2 (RFC 1723)

Standards Supported (cont.)	3Com Enterprise MIBs allow you to manage unique and advanced functionality of 3Com devices. ■ **3cFddi.mib** — 3Com FDDI MIB (43.29.10) ■ **3cFilter.mib** — 3Com Packet Filtering MIB, standard and custom (43.29.4.20) ■ **3cPolicy.mib** — 3Com Policy Management MIB (43.29.4.23) ■ **3cPoll.mib** — 3Com Remote Polling MIB (43.29.4.22) ■ **3cProd.mib** — 3Com Transcend Product Management MIB (43.1) ■ **3cQos.mib** — 3Com QoS MIB (43.29.4.21) ■ **3cSys.mib** — 3Com System MIB (43.29.4) ■ **3cSysBridge.mib** — 3Com Bridging MIB (43.29.4.10) ■ **3cSysFt.mib** — 3Com File Transfer MIB (43.29.4.14) ■ **3cSysSmt.mib** — 3Com SMT MIB (43.29.4.9) ■ **3cTrunk.mib** — 3Com Port Trunking MIB (43.10.1.15.1) ■ **3cVlan.mib** — 3Com VLAN MIB (43.10.1.14.1) ■ **3cWeb.mib** — 3Com Web Management MIB (43.29.4.24) *For the most recent list of currently supported MIBs, see the* CoreBuilder 3500 Software Installation and Release Notes.

System LEDs	System Status LEDs	Module Port Status LEDs
	■ **PWR** (Green): System is powered on. ■ **RUN** (Green): System is running diagnostics. ■ **RUN** (Blinking Green): System is operating correctly. ■ **SYS** (Yellow): Processor failed at power up. ■ **SYS** (Blinking Yellow): Hardware/software revision mismatch. ■ **INS** (Yellow): Processor is not fully inserted. ■ **PS1** and **PS2** (Yellow): Power supply is not inserted, is out of specification, or has failed. ■ **FAN** (Yellow): Fan has slowed or shut down. ■ **TEMP** (Yellow): System has overheated. ■ **SERVICE** (Yellow): System is in service mode. ■ **INS** for PCMCIA (Green): PCMCIA card is inserted in system.	■ **PWR** (Green): Module is receiving power. ■ **INS** (Yellow): Module is not fully seated. ■ **ERR** (Yellow): Module has failed a diagnostic procedure. ■ **ERR** (Blinking Yellow): Hardware/ software revision mismatch. ■ **L** (Link Status - Green): Associated port is active. ■ **E** (Port Error - Yellow): Error has occurred with the associated port. ■ **T** (Traffic on port - Blinking Green): Associated port is receiving traffic.

B FIELD-REPLACEABLE COMPONENTS

This appendix contains information on how to remove and replace the CoreBuilder® 3500 field-replaceable components. The components include:

- System processor
- Modules
- Power supply assembly
- Fan tray assembly

Also included is information on replacing the system battery and upgrading the system memory.

Only trained technical personnel may remove and install the system processor, modules, power supply, system memory, and system battery.

Audience Description

This appendix is intended for trained technical personnel only. Do not attempt to remove or replace a CoreBuilder 3500 system processor, module, power supply, system memory, or system battery if you have not had the proper training from 3Com. For training information in the United States and Canada, call 1-800-NET-3COM. For the numbers to call in other locations, visit the 3Com Web site:

www.support.3com.com

WARNING: *Hazardous energy exists within the system. Use extreme caution when you remove or replace the components. Always be careful to avoid electric shock or equipment damage. See "Safety Precautions" next.*

Safety Precautions

Be sure that you follow all safety precautions when you replace components in the system. Hazardous energy exists inside the system chassis. To avoid electric shocks, burns, or equipment damage, read and following these warnings:

WARNINGS: *Always disconnect the power cord before you open any electronics chassis box or enclosure. When the system is on:*

- *Never insert a metal object such as a screwdriver or a finger with jewelry into open module slots.*
- *Do not touch any connections within the chassis with your hands or fingers.*

ESD Safety Information

Electrostatic discharge (ESD) can damage components on the system processor board or on a module. ESD, which occurs when the board is improperly handled, can cause intermittent failures. To prevent ESD-related damage:

- Always wear an ESD wrist strap, ensuring that it makes good skin contact and is attached to a proper ground.
- Keep the board in its antistatic shielded bag until you are ready to install it.
- Always handle the board by its edges.
- Do not touch the components, pins, leads, or solder connections.

System Processor Removal and Replacement

3Com recommends that you remove the power cord from the system when you replace the system processor. To remove and replace the processor:

1. Read and follow all "Safety Precautions" earlier in this appendix.
2. Disconnect the power cord from the power receptacle.
3. Record their positions and then disconnect all cables attached to the system processor.
4. Loosen the two captive screws that secure the system processor in the chassis.
5. Move the injector/ejector handles to the outward (eject) position. See Figure 25.
6. Gently slide the system processor out of the chassis.

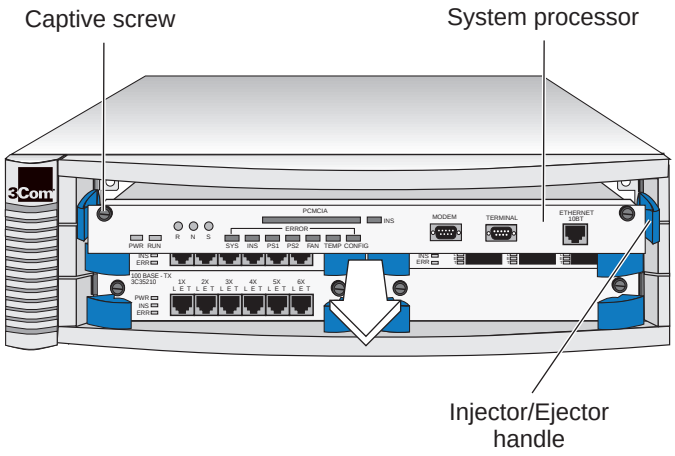
To replace the system processor:

1. Ensure that you are properly grounded.
2. Insert the new system processor in the chassis guides.
3. Gently slide the processor into the chassis until it touches the backplane.
4. Move the injector/ejector handles to the inward (inject) position. You feel a slight resistance as the system processor connectors and backplane connectors engage.

CAUTION: *If the resistance is too great, the system processor connectors and backplane connectors may not be aligned. Forcing the system processor inward can damage the board and backplane connectors. If necessary, remove and reinsert the system processor, ensuring that the connectors are properly aligned. Do not seat the system processor by tightening the captive screws.*

5. Tighten the captive screws to secure the system processor in the chassis.
6. Reconnect all cables to the system processor.
7. Lift the power supply latch and insert the power cord into the system.
8. Insert the other end of the power cord into the building's power outlet.

Figure 25 Removing and Replacing the System Processor



Module Removal and Replacement

You can remove and replace a module with the power on. To remove and replace a module, follow the steps in this section.

To remove a module:

1. Read and follow all "Safety Precautions" earlier in this appendix.
2. Record the connections so that you can reconnect them to the new module. Then disconnect all cables attached to the module.
3. Loosen the captive screws that secure the module in the chassis.
4. Move the injector/ejector handles to the outward (eject) position.
5. Gently slide the module from the chassis.

To replace a module:

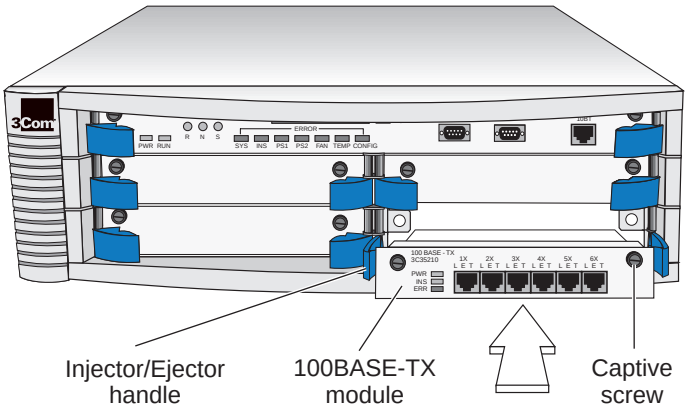
1. Read and follow all "Safety Precautions" earlier in this appendix.
2. Ensure that you are properly grounded.
3. Insert the module in the chassis guides.
4. Gently slide the module into the chassis until it touches the backplane.
5. Move the injector/ejector handles to the inward (inject) position. You feel a slight resistance as the module connectors and backplane connectors engage.

CAUTION: *If the resistance is too great, the module connectors and backplane connectors may not be aligned. Forcing the module forward can damage the board and backplane connectors. If necessary, remove and reinsert the module, ensuring that the connectors are properly aligned. Do not seat the module by tightening the captive screws.*

6 Tighten the captive screws to secure the module in the chassis.

7 Reconnect all cables to the module.

Figure 26 Removing and Replacing a Module



Power Supply Assemblies Removal and Replacement

The CoreBuilder 3500 system operates using a single power supply assembly. You can add a second power supply to the system for fault-tolerant redundancy. If either power supply fails, the associated power supply LED (PS1 or PS2) on the system's front panel lights yellow.

Removing and Replacing the Power Supply

1 Read and follow all "Safety Precautions" earlier in this appendix.

2 Lift the power supply latch to disconnect the power cord and remove it from the system.

3 Loosen the captive screws that secure the power supply to the chassis.

4 Grasp the power supply handle and gently slide the power supply out of the chassis.

5 Gently slide the new power supply into the chassis.

6 To seat the power supply, ensure that the power supply connectors and backplane connectors are aligned. Then push the power supply inward until the connectors engage. You feel a slight resistance as the connectors engage.

CAUTION: *If the resistance is too great, the power supply connectors and backplane connectors may not be aligned. Forcing the power supply inward can damage the power supply or backplane connectors. If necessary, remove and reinsert the power supply, ensuring that the connectors are properly aligned.*

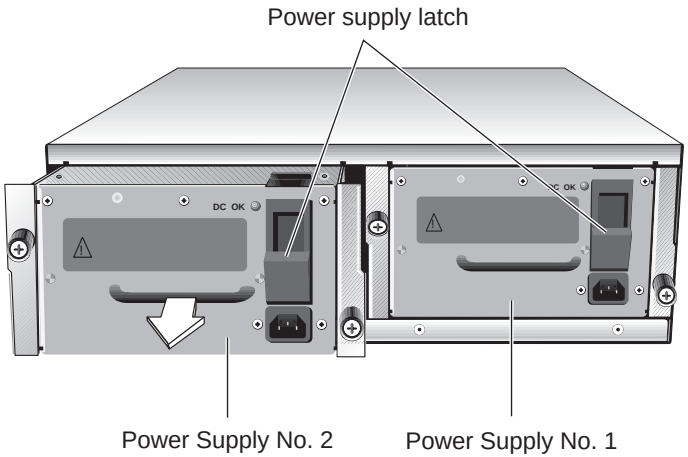
7 Tighten the captive screws that secure the power supply to the chassis.

8 Lift the power supply latch and insert the power cord into the system.

9 Insert the other end of the power cord into the building's power outlet.

If your system has two power supplies, be sure to connect the second power supply. Leaving the second power supply installed but not connected to the power outlet causes the system diagnostics to generate a power supply error.

Figure 27 Removing and Replacing the Power Supplies



The power supply LED on the system processor lights green when the related power supply is operating properly.

Fan Tray Assembly Removal and Replacement

The system processor and modules are cooled by the fan tray assembly, which contains two 12-volt DC fans. The fans are thermally controlled, which means that they run at slower speeds when the system is operating at temperatures of less than 30 °C (86 °F) and at full speed when the system temperature is above that.

You need no tools to remove the fan tray. You can remove and replace the fan tray with the power on.

To remove and replace the fan tray assembly, follow these steps:

1 Facing the front of the system, squeeze the fan tray mounting tab.

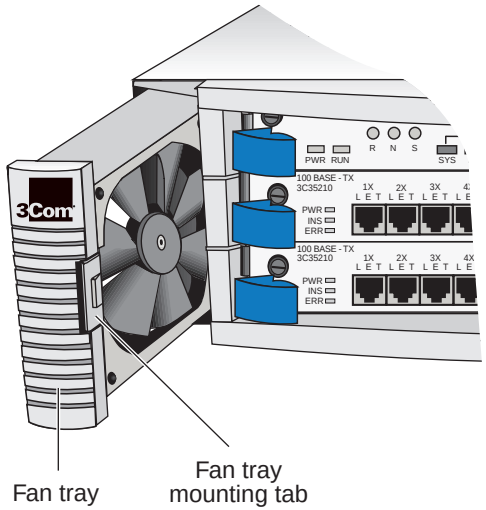
2 Slide the fan tray out of the system.

3 Slide the new fan tray into the system chassis.

4 To seat the fan tray, ensure that the fan tray connectors and backplane connectors are aligned, and then push the fan tray inward until the connectors engage. You feel a slight resistance as the connectors engage.

CAUTION: *If the resistance is too great, the fan tray connectors and backplane connectors may not be aligned. Forcing the fan tray inward can damage the fan tray or the backplane connectors. If necessary, remove and reinsert the fan tray, ensuring that the connectors are properly aligned.*

Figure 28 Removing and Replacing the Fan Tray



System Processor Battery Replacement

The real-time clock for the system is supported by a 950mA hour lithium battery located on the system processor. The battery, which has a shelf life of 7 to 10 years, provides more than 3 years of total hold-up time. This section describes how to remove and replace the battery.

WARNING: *There is a danger of explosion if the battery is incorrectly replaced. Replace the battery with the same or equivalent type as recommended by the manufacturer (Tadiran Model TL-5111). Dispose of the battery according to the manufacturer's instructions.*

ACHTUNG: *Explosionsgefahr, Falls die Batterie falsch eingesetzt ist. Benutzt die Batterie order equivalent type (Gleichwertige), die vom Hersteller empfohlen wird (Tadiran Model TL-5111). Die Batterie wird nach dem Herstellersvorschriften beseitigt.*

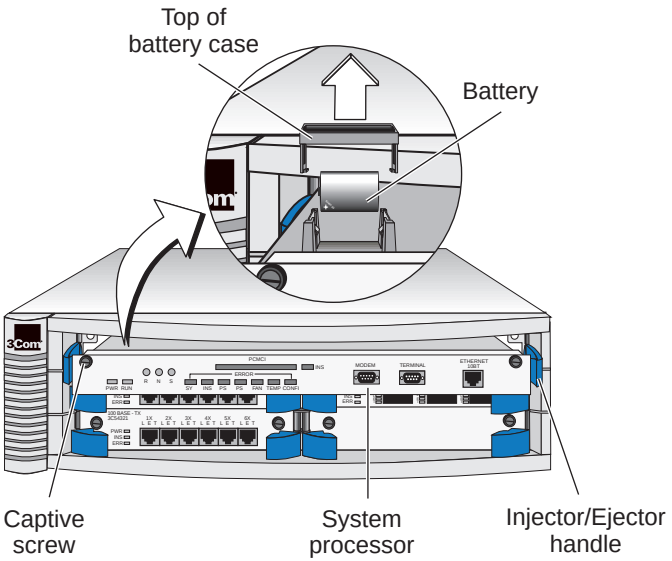
Attention: *Remplacer uniquement avec une batterie du meme type ou d'un type recommandé par le constructeur. Mettre au rebut les batteries usagees comformement aux instructions du fabricant.*

Removing the Battery

To remove the battery that is located on the system processor:

1. Disconnect the power cord from the system.
2. Loosen the two captive screws that secure the system processor to the chassis.
3. Move the injector/ejector handles to the outward position.
4. Gently slide the system processor out of the chassis.
5. Locate the battery on the left front side of the system processor. See Figure 29.
6. Remove the top of the battery mounting case.
7. Remove the battery from the system.

Figure 29 Removing the System Battery



Installing the Battery

To install the new battery onto the system processor, follow the steps in this section.

CAUTION: *When you are handling the system processor, 3Com recommends that you always use a wrist strap connected to a proper ground. This precaution helps prevent the system processor from damage by electrostatic discharge.*

1. Ensure that you are properly grounded.
2. Place the new battery into the battery case, verifying that the polarity (+/–) on the battery matches the polarity that is marked on the system processor.
3. Place the top of the battery case over the battery.
4. Slide the system processor into the chassis.
5. Move the injector/ejector handles to the inward position to engage the system processor and backplane connectors. You feel a slight resistance as the connectors engage.

CAUTION: *If the resistance is too great, the system processor and backplane connectors may not be aligned. Forcing the system processor inward can damage the board or backplane connectors. If necessary, remove and reinsert the system processor, verifying that the connectors are properly aligned. Do not seat the system processor by tightening the captive screws.*

6. Tighten the captive screws to secure the system processor in the chassis.
7. Lift the power supply latch and insert the power cord into the system.

C Site Requirements and Safety Codes

This appendix summarizes the criteria that your site must meet for the CoreBuilder® 3500 system to operate safely and effectively.

The topics covered in this appendix:

- General Safety Requirements
- Wiring Closet Recommendations
- Distribution Rack Requirements
- Building and Electrical Codes

General Safety Requirements

For safe operation, your site must meet these general safety requirements:

- All environmental requirements listed in Appendix A and in "Wiring Closet Recommendations" next. Pay special attention to temperature and humidity.
- All building and electrical codes for your city and country. Refer to relevant "Building and Electrical Codes" for more information.
- All grounding requirements listed in "Wiring Closet Recommendations" and "Distribution Rack Requirements" in the next two sections.

Wiring Closet Recommendations

The cabling system plan used at your facility probably covers most wiring closet concerns. 3Com also recommends that you check these items:

- Verify that your wiring closet meets all of the requirements mentioned in your facility cabling plan.
- Verify that your wiring closet and your facility meet all state, local, and country building and wiring codes.
- Be sure that your system is easily accessible for installation and service.
- Provide adequate overhead lighting for easy maintenance.
- Be sure that all wiring closet doors have locks to prevent unauthorized access.
- Assign wiring closet identification numbers using architectural location codes or some type of floor-grid matrix.
- Be sure that the wiring closet floor is flat and level. If you are using distribution racks and the floor is not level, bolt the racks to the floor to prevent them from tipping over.
- Use a vinyl floor covering for your wiring closet. Concrete floors accumulate dust; carpets can cause static electricity.

- Be sure that each wiring closet has a suitable ground. Ground all metal racks, enclosures, boxes, and raceways in the closet.
- Use AC power, 15-amp service receptacles, type N5/15 or NEMA 5-15R for 120VAC, and the other system specifications shown in Appendix A.
- Be especially sure to meet all system environmental requirements in Appendix A, such as ambient temperature and humidity.
- Be sure that the ventilation in the wiring closet is adequate to maintain a temperature below 40 °C (104 °F).
- Install a reliable air conditioning and ventilation system if you plan to have two or more systems in a single wiring closet.
- During nonbusiness hours, guard against an accidental shutdown of the ventilation while a system remains powered up; the equipment might overheat.

Distribution Rack Requirements

If you plan to mount your systems in a distribution rack, your rack must meet the basic mechanical and space requirements described in this section.

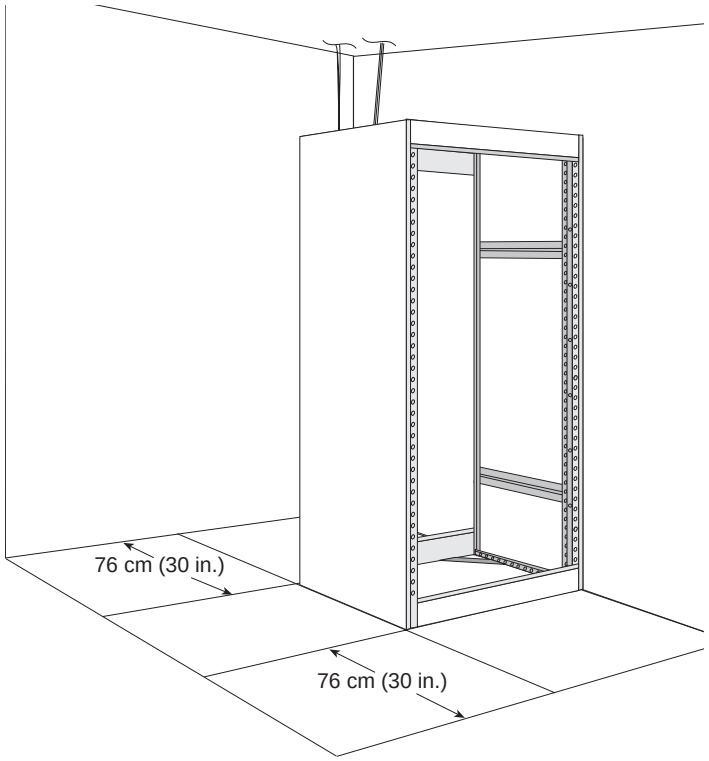
Protective Grounding for the Rack

Proper distribution rack grounding ensures that voltages induced into wiring by lightning or other disturbances are directed to ground. Normally, you use a distribution rack grounding kit and a ground conductor that is carried back to earth or to another suitable building ground. To order the grounding kit, contact your network supplier.

Space Requirements for the Rack

Provide enough space in front of and behind the system so that you can service it easily. Allow a minimum of 76 cm (30 in.) between the rack and any wall behind or in front of it. Extra room on each side is optional. See Figure 30.

Figure 30 Recommended Service Access



Mechanical Requirements for the Rack

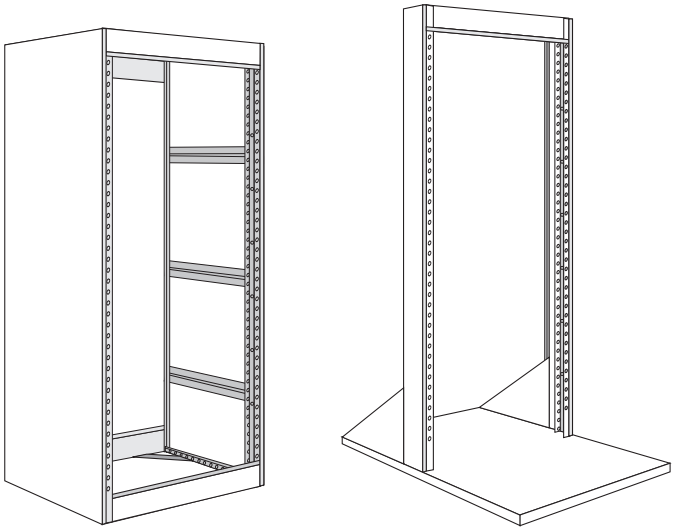
Verify that your racks comply with the standards and requirements as specified in your cabling system plan and also that they conform to certain conventional standards:

- In the United States, use EIA Standard RS-310C: Racks, Panels, and Associated Equipment.
- In countries other than the United States, use IEC Standard 297: Dimensions of Panels and Racks.

In addition, 3Com recommends that your distribution rack meets these requirements:

- Use an open style, 48 cm (19 in.) rack. The rack styles shown in Figure 31 facilitate easy maintenance and provide excellent ventilation.
- Use a rack that has the universal mounting rail hole pattern identified in IEC Standard 297.
- Use a rack that is made of steel.
- Install equipment in the lower half of the distribution rack to avoid making the rack top-heavy.
- Use a rack that has adequate electrical grounding, for instance, with a distribution rack grounding kit. Contact your network supplier.
- Verify that the floor under the rack is level within 5 mm ($3/16$ in.). Use a floor-leveling cement compound if necessary, or bolt the racks to the floor with 9.5 mm ($3/8$ in.) lag screws or equivalent hardware.
- Brace open distribution racks if the channel thickness is less than 6.4 mm (.25 in.)

Figure 31 Recommended Rack Styles



Building and Electrical Codes

Follow all appropriate building codes and authorities on electrical codes when planning your site and installing your cable for the system.

Specific building and electrical codes vary depending on your location. The following lists are provided as resources to help you find additional information. In countries other than the United States, consult the appropriate regulatory and industry organization.

U.S. Building Codes

Major building codes:

- Uniform Building Code

  International Conference of Building Officials (ICBO)
  Headquarters: 5360 Workman Mill Road
  Whittier CA 90601-2298 USA
  www.icbo.org

- BOCA Basic Building Code

  Building Officials and Code Administrators (BOCA) International, Inc.
  Headquarters: 4051 West Flossmoor Road
  Country Club Hills IL 60478 USA
  www.bocai.org

- Standard Building Code (SBC)

  Southern Building Code Congress International, Inc.
  900 Montclair Road
  Birmingham AL 35213-1206 USA
  www.sbcci.org

U.S. Electrical Codes

Authorities on electrical codes:

- National Electrical Code (NEC) Classification — A recognized authority on safe electrical wiring. U.S. Federal, state, and local governments use NEC standards to establish their own laws, ordinances, and codes on wiring specifications. The NEC Classification is published by:

  National Fire Protection Association (NFPA)
  1 Batterymarch Park
  P.O. Box 9101
  Quincy MA 02269-9109 USA
  www.nfpa.org

- Underwriters' Laboratories (UL) Listing — An independent research and testing laboratory. UL evaluates the performance and capability of electrical wiring and equipment to determine whether they meet certain safety standards when properly used. Acceptance is usually indicated by the words "UL Approved" or "UL Listed."

  UL
  333 Pfingsten Road
  Northbrook IL 60062-2096 USA
  www.ul.com

- National Electrical Manufacturers Association (NEMA) — An organization of electrical product manufacturers. Members develop consensus standards for cables, wiring, and electrical components.

  NEMA
  1300 North 17th Street, Suite 1847
  Rosslyn VA 22209 USA
  www.nema.org

- Electronic Industries Association (EIA) — A trade association that develops technical standards, disseminates marketing data, and maintains contact with government agencies in matters relating to electronics and related industries.

  EIA
  2500 Wilson Boulevard
  Arlington VA 22201-3834 USA
  www.eia.org

D TECHNICAL SUPPORT

3Com provides easy access to technical support information through a variety of services. This appendix describes these services.

Information contained in this appendix is correct at time of publication. For the most recent information, 3Com recommends that you access the 3Com Corporation World Wide Web site.

Online Technical Services

3Com offers worldwide product support 24 hours a day, 7 days a week, through the following online systems:

- World Wide Web site
- 3Com Knowledgebase Web Services
- 3Com FTP site
- 3Com Bulletin Board Service (3Com BBS)
- 3Com Facts℠ Automated Fax Service

World Wide Web Site

To access the latest networking information on the 3Com Corporation World Wide Web site, enter this URL into your Internet browser:

`http://www.3com.com/`

This service provides access to online support information such as technical documentation and software library, as well as support options that range from technical education to maintenance and professional services.

3Com Knowledgebase Web Services

This interactive tool contains technical product information compiled by 3Com expert technical engineers around the globe. Located on the World Wide Web at **`http://knowledgebase.3com.com`**, this service gives all 3Com customers and partners complementary, round-the-clock access to technical information on most 3Com products.

3Com FTP Site

Download drivers, patches, software, and MIBs across the Internet from the 3Com public FTP site. This service is available 24 hours a day, 7 days a week.

To connect to the 3Com FTP site, enter the following information into your FTP client:

- Hostname: **`ftp.3com.com`**
- Username: **`anonymous`**
- Password: **`<your Internet e-mail address>`**

You do not need a user name and password with Web browser software such as Netscape Navigator or Communicator and Internet Explorer.

3Com Bulletin Board Service

The 3Com BBS contains patches, software, and drivers for 3Com products. This service is available through analog modem or digital modem (ISDN) 24 hours a day, 7 days a week.

Access by Analog Modem

To reach the service by modem, set your modem to 8 data bits, no parity, and 1 stop bit. Call the telephone number nearest you:

Country	Data Rate	Telephone Number
Australia	Up to 14,400 bps	61 2 9955 2073
Brazil	Up to 28,800 bps	55 11 5181 9666
France	Up to 14,400 bps	33 1 6986 6954
Germany	Up to 28,800 bps	4989 62732 188
Hong Kong	Up to 14,400 bps	852 2537 5601
Italy	Up to 14,400 bps	39 2 27300680
Japan	Up to 14,400 bps	81 3 5977 7977
Mexico	Up to 28,800 bps	52 5 520 7835
P.R. of China	Up to 14,400 bps	86 10 684 92351
Taiwan, R.O.C.	Up to 14,400 bps	886 2 377 5840
U.K.	Up to 28,800 bps	44 1442 438278
U.S.A.	Up to 53,333 bps	1 847 262 6000

Access by Digital Modem

ISDN users can dial in to the 3Com BBS using a digital modem for fast access up to 64 Kbps. To access the 3Com BBS using ISDN, call the following number:

1 847 262 6000

3Com Facts Automated Fax Service

The 3Com Facts automated fax service provides technical articles, diagrams, and troubleshooting instructions on 3Com products 24 hours a day, 7 days a week.

Call 3Com Facts using your Touch-Tone telephone:

1 408 727 7021

Support from Your Network Supplier

If you require additional assistance, contact your network supplier. Many suppliers are authorized 3Com service partners who are qualified to provide a variety of services, including network planning, installation, hardware maintenance, application training, and support services.

When you contact your network supplier for assistance, have the following information ready:

- Product model name, part number, and serial number
- A list of system hardware and software, including revision levels
- Diagnostic error messages
- Details about recent configuration changes, if applicable

If you are unable to contact your network supplier, see the following section on how to contact 3Com.

Support from 3Com

If you are unable to obtain assistance from the 3Com online technical resources or from your network supplier, 3Com offers technical telephone support services. To find out more about your support options, call the 3Com technical telephone support phone number at the location nearest you.

When you contact 3Com for assistance, have the following information ready:

- Product model name, part number, and serial number
- A list of system hardware and software, including revision levels
- Diagnostic error messages
- Details about recent configuration changes, if applicable

Here is a list of worldwide technical telephone support numbers:

Country	Telephone Number
Asia Pacific Rim	
Australia	1 800 678 515
Hong Kong	800 933 486
India	+61 2 9937 5085
Indonesia	001 800 61 009
Japan	0031 61 6439
Malaysia	1800 801 777
New Zealand	0800 446 398
Pakistan	+61 2 9937 5085
Philippines	1235 61 266 2602
P.R. of China	10800 61 00137 or 021 6350 1590
Singapore	800 6161 463
S. Korea	
From anywhere in S. Korea:	00798 611 2230
From Seoul:	(0)2 3455 6455
Taiwan, R.O.C.	0080 611 261
Thailand	001 800 611 2000

Country	Telephone Number
Europe	
From anywhere in Europe, call:	+31 (0)30 6029900 phone +31 (0)30 6029999 fax
Europe, South Africa, and Middle East	
From the following countries, call these toll-free numbers:	
Austria	0800 297468
Belgium	0800 71429
Denmark	800 17309
Finland	0800 113153
France	0800 917959
Germany	0800 1821502
Hungary	00800 12813
Ireland	1800 553117
Israel	1800 9453794
Italy	1678 79489
Netherlands	0800 0227788
Norway	800 11376
Poland	00800 3111206
Portugal	0800 831416
South Africa	0800 995014
Spain	900 983125
Sweden	020 795482
Switzerland	0800 55 3072
U.K.	0800 966197
Latin America	
Argentina	AT&T +800 666 5065
Brazil	0800 13 3266
Chile	1230 020 0645
Colombia	98012 2127
Mexico	01 800 CARE (01 800 2273)
Peru	AT&T +800 666 5065
Puerto Rico	800 666 5065
Venezuela	AT&T +800 666 5065
North America	1 800 NET 3Com (1 800 638 3266) Enterprise Customers: 1 800 876-3266

Returning Products for Repair

Before you send a product directly to 3Com for repair, you must first obtain an authorization number. Products sent to 3Com without authorization numbers will be returned to the sender unopened, at the sender's expense. To obtain an authorization number, call or fax:

Country	Telephone Number	Fax Number
Asia, Pacific Rim	+65 543 6500	+65 543 6348
Europe, South Africa, and Middle East	+31 30 6029900	+31 30 6029999

From the following countries, you may call the toll-free numbers; select option 2 and then option 2:

Austria	0800 297468
Belgium	0800 71429
Denmark	800 17309
Finland	0800 113153
France	0800 917959
Germany	0800 1821502
Hungary	00800 12813
Ireland	1800 553117
Israel	1800 9453794
Italy	1678 79489
Netherlands	0800 0227788
Norway	800 11376
Poland	00800 3111206
Portugal	0800 831416
South Africa	0800 995014
Spain	900 983125
Sweden	020 795482
Switzerland	0800 55 3072
U.K.	0800 966197

Country	Telephone Number	Fax Number
Latin America	1 408 326 2927 (not toll-free)	1 408 326 3355 (not toll-free)
U.S.A. and Canada	1 800 NET 3Com (1 800 638 3266) Enterprise Customers: 1 800 876 3266	1 408 326 7120 (not toll-free)

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CoreBuilder® 3500 High-Function Switch

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